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THE RICE PRODUCTION PROGRAM IN RIZAL PROVINCE:
ITS IMPACT AND IMPLICATIONS

(May 1966 - June 1968)

the agricultural executives, inc.

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I. THE RICE PROBLEM

1.1. Introduction

One of the most pressing problems that confronts a developing country like the Philippines is the attainment of self-sufficiency in rice to feed the increasing population. There are many factors that hinder the increase in rice production and the most important that we will consider is the approach used in assailing the rice problem. There is the lack of coordinated, concentrated and continuing approach toward rice problem.

This review will attempt to discuss the basic approaches used by a provincial government in the solution of an increased productivity. Before any approach is made, it is equally important to know the progress in rice technology. This progress has two components: one is the invention or discovery of new knowledge; the other is the application of these new ideas in productive processes or better known as innovation. An example is IR8 which is a newly discovered rice variety and the methods used in the care and management of this variety in the farmer's field are the innovations. The first component can be referred to as research and the second as the adoption process or utilization of research findings.

1.2. Research and Extension

The attention in rice research is focused to looking for rice varieties that would give better yielding abilities than the present varieties being used by farmers. The search for a type of variety of rice with a high yielding quality and possessing other desirable characteristics including a better input-output relationship, has been a long range research program. This type of research has been one of the objectives of the International Rice Research Institute (IRRI). The development of a new type of variety known as IR8 is a major breakthrough in rice research. The remarkable yielding quality was the primary consideration rather than the grain and eating quality of the variety.

The good and positive results of rice research must be felt and known by farmers who are always receptive of the good high yielding variety of rice that would give them an economic advantage. The government now besets with the problem of lookingfor inroads of research findings in the farmer's field.

A cultural gap commonly exists in communicating with and extending research findings to farmers because of the social class to they belong. The gap is at times dramatized by the great difference in intelligence, a difficulty on the part of the farmer to play with concepts to think of himself in reflective terms, and to take an experimental risk-taking view on life. This is somewhat related to what psychologist call as "cultural deprivation". Because farmers live in an environment which lacks the intellectual stimuli, it results in the low motivation for conceptual growth. This rural mentality which is common to a Filipino farmer deprives him of the conceptual background that would create a mind open to technological change. Thus, the process of communication results in a very low rate in adapting innovations in rice technology. The effectiveness of utilizing research findings on rice culture and management into farmer's field is not so convincing nor encouraging. In addition to research institutions like IRRI, UPCA and others, a continuous output of trained agricultural extension and rural development workers are on hand to support the government on rice production. Their common objective is to impart to farmers the potentials of rice production using the modern concept in rice culture. But inspite of everything, there are still no tangible results of effective utilization.

At this stage, it is suffice to say that the problem of increased rice productivity can be attained by immediately applying experiences of other countries and findings of research institutions whose main line of work is the improvement of rice. In the process, it is of course expected that an enormous amount of ability and innovating capacity must be invested to adopt innovations and put them to work in local conditions. The transition should be done at the least possible time. The country can infinitely accelerate its rate of productivity for the foreseeable future by merely importing and adopting research and foreign technology. There will be no need to develop local research program in actual implementation.

Since current research findings on rice are already available, it is now the concern of the potential end-users to apply them. But, farmers have limited access to these findings and the government can help the end-users through a program of agricultural development by extending them innovations in rice technology. Administrator and planning experts write out programs on rice production with similarity in objectives. Among those are (a) increasing rice productivity per unit area, and (b) increasing farm income and consequently, the level of living. Our implementing body responsible for carrying out national rice programs is the Rice and Corn Production Coordinating Council (RCPCC).

1.3. Rice Production Programs

The RCPCC was organized in order to intensify the implementation of the increased production of rice in the country. The Council is the highest governing body which. formulates policies, rules and regulations concerning the rice and corn production program and which has the power to re-allocate any savings for the proper implementation of its program. Because of its large scope of operation, the channel of implementation goes down to regional committees and the provincial and rural committees. This entire organizational set-up composed of many channels would creep to red-tape and the implementation is not carried out as fast as it should be. Sometimes, the implementation is not at all carried out in the farmer's field. On the onset, however, inspite of this complexity, the program of RCPCC has received an overwhelming support from the private and government sector and foreign assistance for resource development completely changed the structure of rice production in the Philippines.

The provinces of Laguna and Tarlac, and the Bicol regions spearheaded area development program in their respective areas with special emphasis on rice production. The first two provinces mentioned above were pilot provinces in area development program of the government known as 'Operation SPREAD'. The US-AID is assisting these projects. It seems, however, that the most remarkable rice program ever implemented so far without foreign assistance or even aid from national government is being carried out in the province of Rizal. An integrated agricultural program was prepared and currently being implemented by the Agricultural Development Council for Rizal.

In the development stage of the program, it is expected that farmers will themselves take the initiative of increasing their productivity to help produce sufficient rice for the country. The program will provide for an adequate credit, reliable extension services, resource development and other concomitant variables needed in making agriculture productive. With all the provisions for technical and financial assistance, the political leadership will surely boost the agricultural development program in the province of Rizal.

This is the very first attempt whereby the provincial government would undertake an agricultural development program by contributing its own financial resources, utilizing the manpower and resources of national agencies located in the province and assuming the full responsibilities for such actions.

II. AGRICULTURAL SITUATION IN RIZAL PROVINCE

2.1. Geographical Location and Topography

The province of Rizal is situated in the southwestern part of Luzon. It is bounded on the north by Bulacan province, on the east by Quezon province, on the south by the provinces of Laguna and Cavite, on the west by the Manila Bay. The length of the province from north to south is about 83.6 kilometers on the average while the width, from east to west, is about 69.1 kilometers. Pasig, the capital of Rizal province, is about 12 kilometers from the city of Manila. Geographically, Rizal province lies within 50°40' north latitude. The map of the province showing the geographical boundaries of municipalities is shown in Figure 1.

The surface features of the province show a mixed topography: the western part is low and flat whereas the regions bordering Laguna lake are either narrow coastal plains or small promontories. The rest of the province is a region broken by the spurs and ridges of the Sierra Madre mountains.

The largest valley in the province is the Marikina Valley which extends from Pasig to the town of Montalban. This valley covers an area of approximately 19,450 hectares. The Marikina river, on the westside of the valley, flows throughout the valley's length. Another valley, the Teresa valley, located within the vicinity of the town of Teresa

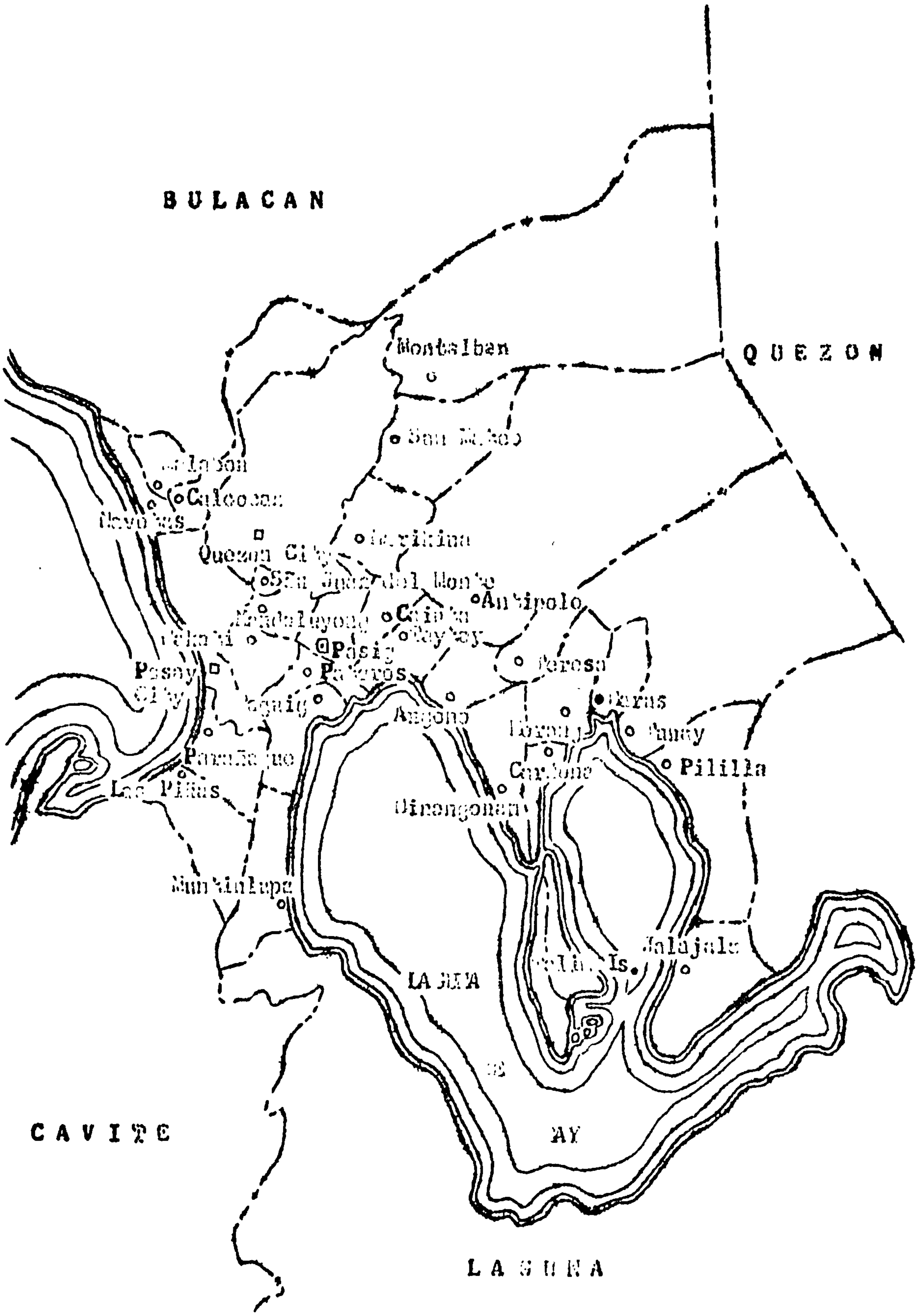


Fig. 1. Map of Rizal Province showing geographical boundaries.

Source: 1960 Census of Agriculture

has an area of 2,000 hectares. However, Teresa valley is a limestone area.

There are seven principal mountains in the province, namely: (1) Bantay mountain in Montalban, (2) Tayabasan, (3) Lumuban, (4) Pico-Susong Dalaga in Bosoboso (a former municipality now a part of the town of Antipolo), (5) Imawang, (6) Dupalig in Tanay and (7) Susong Dalaga in Talim Island.

The principal rivers in the province are the Pasig river and the Marikina river both of which drain into Laguna de Bay. The Marikina river, originating from the mountains of Montalban, drains the whole valley after passing through the towns of Montalban, San Mateo, Marikina and Pasig. This river joins the Pasig river which then empties into the Manila Bay.

The Montalban Dam which stores water for the Metropolitan Manila is in the province.

2.2. Soil and Climate

2.2.1. Soil

The underlying soil of the province is mainly tertiary. Deposits of limestones, shales and sandstones are found in several places within the province.

Because of the overlapping of soil materials, soil classification of the province is difficult. While a large part of the province is covered by tuffaceous materials, there are also many areas with limestone deposits, volcanic tuff, and basalts. The diversity of parent materials influencing soil formation has led to the classification of Rizal soils into ten different classes. They are as follows:

a. Hydrosol - which is utilized mostly for fishponds and saltbeds, covers 1,300 hectares in area.

b. Obando fine sandy loam - which is suitable to rice and vegetables, extends over 1,995 hectares.

c. Prensa clay loam - which is also used for rice, is estimated to cover 2,090 hectares of the province.

d. Novaliches loam - occuring both on upland and lowland on rolling and hilly topography, is planted to rice, mango and other fruit trees. It extends over 39,280 hectares.

e. Guadalupe clay - which is utilized for rice, extends over 20,640 hectares.

f. Antipolo soils - (clay and undifferentiated), covering over 124,000 hectares of the provincial land area, is planted to rice and orchcrds (cashew, duhat and others). The differentiated

Antipolo soils, however, are suitable for cultivation but may be used for grazing land.

g. Quingua loam - which covers over 2,000 hectares of the province, is suitable to rice.

h. Bay clay loam - which extends over 2,500 hectares along the Laguna lake shore, is deposited by accretion from lake.

i. Marikina loam - (silt and clay) covers all of the Marikina valley from the towns of Marikina to Pateros. About 17,000 hectares of which is planted to rice.

j. Binangonan clay - typically of limestone origin, this class covers the Teresa valley and a strip of land from the northern part of Binangonan to Montalban municipalities (about 20,000 hectares).

Thus, the Antipolo and Novaliches soil types occupy the greater portion of the province. The Marikina silt loam soil (about 11,250 hectares) may be considered the best soil in the province particularly for rice and other crops.

However, the soils in the province are slightly acidic with pH ranging from 5.95 to 6.95. Most soils in Rizal province require fertilizer treatment to remedy deficiencies in phosporous and potash.

2.2.2. Climate

The climate of Rizal is classified under two types; the western portion falls under the first type with two distinct seasons, a dry season from December to April and wet season from May to November. The eastern portion of the province is classified the fourth type, with rainfall more or less distributed throughout the year. The annual rainfall average is 106.47 with an average peak of 22.68 inches in August and a low of 0.67 inch in January. The heaviest rainfall is in July, August and September, when 70 per cent of the yearly rainfall occurs. The swelling of the Laguna de Bay and Marikina river and its tributaries during the heavy rainy season oftentimes causes widespread damage to crops and properties in its lowlands. The highest monthly average temperature is 82.8°F in April, May and June and the coolest are December, January and February.

The rainfall and temperature records for the province are shown in Table 1 and Figure 2.

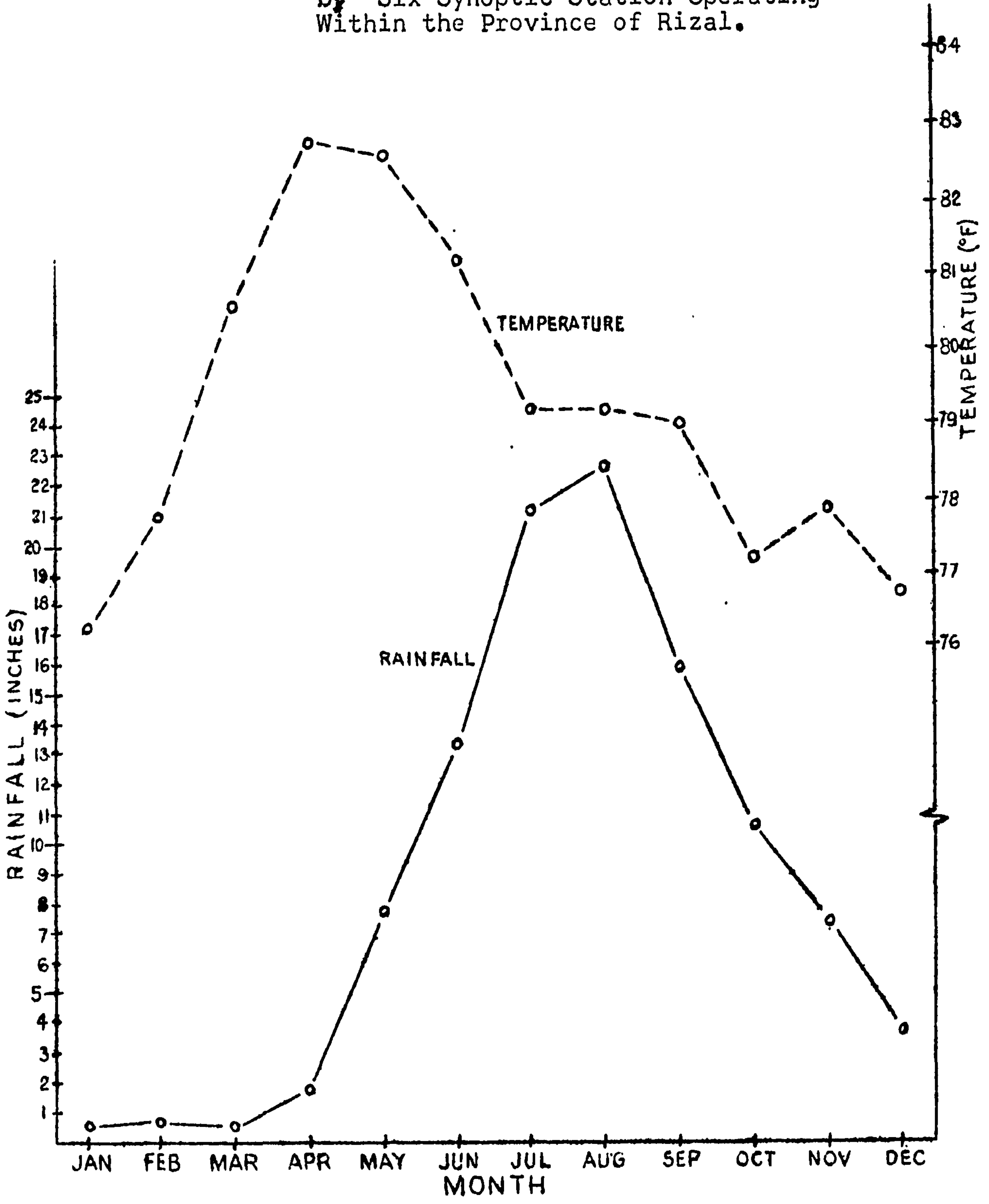
Protected from violent winds by the Sierra Madre mountains on the southwest, the province is seldom lashed by severe typhoons. However, typhoons and floods in Manila and in the Central Plain of Luzon at times affect the western part of the province particularly the lowlands.

Table 1. RECORDS OF AVERAGE MONTHLY RAINFALL AND TEMPERATURE OF SIX SYNOPTIC STATION OPERATING WITHIN THE PROVINCE OF RIZAL. 1966.

Month	Rainfall (inches)	Temperature (°F)
January	0.57	76.3
February	0.76	77.8
March	0.69	80.6
April	1.80	82.8
May	7.78	82.6
June	13.37	81.2
July	21.12	79.2
August	22.68	79.2
September	15.97	79.0
October	10.73	77.2
November	7.28	77.9
December	3.72	76.7
Average	8.87	79.2

Source: Data based on reports to the Weather Bureau by six synoptic stations within the province.

Figure 2 - . Graph Showing the Average Monthly Rainfall and Temperature as Recorded by Six Synoptic Station Operating Within the Province of Rizal.



The town of Antipolo, being on a high plateau, has temperatures about two degrees centigrade cooler on the average than most other towns of the province. Another site having a cool temperature is the highland of Tanay in the Sierra Madre mountains. The area is now being considered for vegetable farming and dairy projects by the province because of its relatively cool climate.

2.3. Area and Productivity of Crops

Before discussing the area characteristics of irrigated areas and ricelands, it is important to have a knowledge on the land area and farming area of the province. The towns of Montalban, Antipolo and Tanay have the biggest land area in the province being located on the wide mountain range along Sierra Madre. However, only Tanay has proportionately the biggest farming area among the three municipalities but a vast portion of which is used for upland farming. It is actually the municipality of Morong that has the biggest area devoted to rice farming. Around 23 percent of its total land area is devoted to farming while 73 per cent of the farming area is riceland. The estimated total land area, farming area and area devoted to rice for the different municipalities are shown in Table 2.

Table 2. ESTIMATED TOTAL LAND AREA, TOTAL FARMING AREA AND AREA PLANTED TO RICE IN HECTARES. RIZAL. 1960.

	Municipality	Est. Total Land Area (ha)	Total Farm Area (ha)	Farm Area to Total Land Area %	Rice Area (ha)	Rice Area to Total Farm Area %
1.	Angono	2,596	258 (289)*	10	204 (123)*	79
2.	Baras	2,337	483 (270)	21	279 (239)	58
3.	Binangonan	7,273	724 (682)	10	615 (319)	85
4.	Cainta	1,016	307 (153)	30	257 (151)	84
5.	Cardona	3,116	840 (432)	27	273 (172)	32
6.	Jalajala	4,933	724 (391)	15	652 (342	90
7.	Montalban	31,283	908 (593)	3	869 (552)	96
8.	Morong	3,758	2,297 (1,228)	61	1,479 (1,028)	64
9.	Pililla	7,398	1,112 (486)	15	962 (462)	87
10.	San Mateo	6,490	818 (321)	13	646 (280)	79
11.	Taguig	3,371	883 (444)	26	865 (387)	98
12.	Tanay	24,336	3,985 (784)	16	992 (664)	25
13.	Taytay	3,883	987 (229)	25	848 (221)	86
14.	Teresa	1,861	863 (462)	46	624 (445)	72
15.	Antipolo	30,613	1,801 (576)	6	830 (452)	46
16.	Las Pinas	4,154	726 (357)	17	694 (329)	96
17.	Marikina	3,894	791 (366)	20	685 (346)	87
18.	Muntinglupa	4,673	966 (297)	21	525 (216)	54
19.	Pasig	1,297	907 (449)	70	664 (274)	73
20.	Pateros	1,038	85 (93)	8	65 (35)	76
	Rizal	149,319	19,466 (8,902)		13,028 (7,041)	
			Average	23		73

Source of data: 1960 Census of Agriculture

*( ) Figures in parentheses indicate number of farms.

2.3.1. Irrigated Area

Based on the 1960 Census of Agriculture, the total area of farms is 22,989 as shown in Table 3. It is estimated that only 1/5 of the total area are farms having irrigation facilities. Approximately, one fourth of these farms are irrigated either by gravity flow or by power pump systems. Of the total area of 1,883 hectares, 1,349 hectares are irrigated by gravity flow and 534 hectares by power pump. These inforamtion clearly indicates that there should be more emphasis on irrigation projects in the agricultural program of the province. For a rice production program to become successful, more irrigation facilities should be constructed in order that increased productivity and intensification of cultivated areas can be attained. The availability of irrigation water is a vital factor in rice production. Also, if there are more irrigated areas, a continuous planting for rice can be made possible thus, it is not only the effective area which will increase but likewise, productivity. (Productivity is simply defined as production in kilograms, tons, cavans, or other forms of measurement per unit area.)

As given in Table 4, the area of rice farms under irrigation was 1,230 hectares during the first crop and 900 hectares was under irrigation for the second crop. This table also shows the area distribution of farms in the province by type of irrigation.

Table 3. IRRIGATED AREA IN HECTARES
RIZAL. 1960.

Description	Area (Ha.)
Total Area of Farms	22,989
Area of Farms with Irrigation	4,556
Area of Land	1,883
Irrigated by Grivity Flow	1,349
Irrigated by Power Pump	534

Note: Includes 26 Municipalities and 3 Cities.
Source of Data: 1960 Census of Agriculture.

Table 4. AREA OF RICE FARMS IN HECTARES, BY TYPE OF CROP AND BY TYPE OF IRRIGATION. RIZAL. 1960.

Municipality	*First Crop Lowland (Ha.)*			*Second Crop Lowland (Ha.)*		
	Total	*Under Irrig.*	*Not Under Irrig.*	*Total*	*Under Irrig.*	*Not Under Irrig.*
1. *Angono*	114	3	111	90	16	74
2. *Baras*	196	9	186	120	116	4
3. *Binangonan*	465	37	429	57	28	29
4. *Cainta*	212	-	212	-	-	-
5. *Cardona*	254	24	231	19	14	5
6. *Jalajala*	92	-	92	-	-	-
7. *Montalban*	497	169	328	1	-	1
8. *Morong*	1,318	412	906	214	145	68
9. *Pililla*	606	23	583	373	358	15
10. *San Mateo*	50	-	50	-	-	-
11. *Tagig*	814	18	796	22	-	22
12. *Tanay*	335	282	54	113	91	22
13. *Taytay*	825	46	779	-	-	-
14. *Teresa*	546	-	546	6	-	6
15. *Antipolo*	636	10	626	22	-	22
16. *Las Pinas*	665	-	665	28	-	28
17. *Marikina*	629	-	629	20	-	20
18. *Muntinglupa*	338	17	371	45	32	13
19. *Pasig*	615	182	433	105	98	7
20. *Pateros*	53	-	53	-	-	-
Rizal	9,610	1,230	8,479	1,236	898	338

Source of data: 1960 Census of Agriculture

2.3.2. Rice Area

The area of farms devoted to the production of rice was around 13,118 hectares for the target municipalities considered by the program. Around 73 per cent is planted during the first crop, 10 per cent during the second crop and 17 per cent planted to upland or kaingin areas. Because the particular interest of this review is rice production, a closer examination of the rice area must be done. The main rice farming areas of the province are Morong, Tanay, Pililla and Tagig, the aggregate of which consists almost 40 per cent of the total area planted to rice. The first three municipalities are contiguous to include Baras.

Since the figures presented in Table 5 were obtained in 1960, it is now presumed that some of the rice farms in Antipolo, Las Pinas, Marikina, Muntinglupa and Pasig have been converted into industrial sites or subdivision lots and some have become idle because of speculation in land prices. This is apparent due to nearness to Metropolitan Manila and the high degree of urbanization. Pateros, however, other than the reasons above, has but a small area for rice farming.

These information are used by development planners in locating priorities for rice production, where extension work and rice technology will be emphasized and more production inputs are to be displaced. Such also serves as basis for establishing priorities in the construction of irrigation projects.

Table 5. AREA OF RICE FARMS IN HECTARES, BY TYPE OF CROP. RIZAL. 1960.

Municipality	All Palay (Ha.)	Lowland 1st Crop (Ha.)	Lowland 2nd Crop (Ha.)	Upland or Kaingin (Ha.)
1. Angono	203	114	90	-
2. Baras	323	196	120	8
3. Binangonan	536	465	57	14
4. Cainta	225	212	-	13
5. Cardona	278	254	19	5
6. Jalajala	638	92	-	546
7. Montalban	813	497	1	316
8. Morong	1,597	1,318	214	65
9. Pililla	1,264	606	373	284
10. San Mateo	537	356	-	187
11. Taguig	938	814	22	1
12. Tanay	917	335	113	468
13. Taytay	825	824	-	-
14. Teresa	558	546	6	6
15. Antipolo	797	636	22	139
16. Las Pinas	694	665	28	-
17. Marikina	658	629	20	8
18. Muntinglupa	525	388	45	92
19. Pasig	739	615	105	19
20. Pateros	53	53	-	-
Rizal	13,118	9,610	1,236	2,172

Source of data: 1960 Census of Agriculture

2.3.3. Productivity of Crops

Rice

The rice productivity in Rizal province is comparatively higher than in other provinces. In 1960, rice harvest in Rizal was already 35 cavans per hectare compared to to the national average of only 27 cavans to a hectare. The reasons may be attributed to modern methods in rice production used by farmers in the province. However, there is still room for further improving the productivity of farms through modern farm technology.

The season or culture of crop affects productivity of rice. There is a substantial decrease in production in an upland or kaingin culture as availability of water becomes a cultural problem in growing the crop. Generally, this type of culture is responsible in lowering the national average productivity of rice farms in the Philippines. Unlike in other countries, lowland rice culture is predominantly coupled with good control of water resulting to their high productivity. The productivity of rice farms by type of culture in the province is shown in Table 6, while productivity by type of irrigation is illustrated in Table 7.

Table 6. PRODUCTIVITY OF RICE FARMS IN CAVANS PER HECTARE, BY TYPE OF CULTURE. RIZAL. 1960.

Municipality	All Farms (cav/ha)	Lowland First Crop (cav/ha)	Lowland Second Crop (cav/ha)	Upland or Kaingin (cav/ha)
1. Angono	46	48	45	27
2. Baras	40	40	40	18
3. Binangonan	24	24	28	35
4. Cainta	41	41	-	27
5. Cardona	34	34	38	21
6. Jalajala	23	33	-	28
7. Montalban	37	43	19	26
8. Morong	39	39	43	22
9. Pililla	32	35	36	18
10. San Mateo	35	44	-	18
11. Taguig	36	40	34	23
12. Tanay	28	33	35	12
13. Taytay	37	37	-	-
14. Teresa	37	38	38	31
15. Antipolo	38	39	35	16
16. Las Pinas	35	35	38	-
17. Marikina	44	45	50	18
18. Muntinglupa	29	32	31	25
19. Pasig	39	37	56	-
20. Pateros	33	33	-	-
Rizal	35	37	38	23

Source of basic data: 1960 Census of Agriculture

Table 7. PRODUCTIVITY OF RICE FARMS IN CAVANS PER HECTARE, BY TYPE OF IRRIGATION. RIZAL. 1960.

Municipality		Lowland, First Crop		Lowland, Second Crop	
		Under Irrig.	Not Under Irrig.	Under Irrig.	Not Under Irrig.
1.	Angono	54	48	49	44
2.	Baras	46	40	40	40
3.	Binangonan	31	23	30	27
4.	Cainta	-	41	-	-
5.	Cardona	36	34	40	32
6.	Jalajala	-	33	-	-
7.	Montalban	48	41	-	19
8.	Morong	42	37	44	43
9.	Pililla	42	34	36	33
10.	San Mateo	-	44	-	-
11.	Taguig	46	40	-	34
12.	Tanay	42	32	35	34
13.	Taytay	41	37	-	-
14.	Teresa	-	38	-	38
15.	Antipolo	43	39	-	35
16.	Las Pinas	-	35	-	35
17.	Marikina	-	45	-	50
18.	Muntinglupa	36	31	32	31
19.	Pasig	40	35	57	36
20.	Pateros	-	33	-	-
	Rizal	42	37	40	35

Source of basic data: 1960 Census of Agriculture

Other Crops

The most important crops planted in the province according to area planted other than rice, are mango, corn, banana, coconut and others. The area planted and productivity of crops are shown in Tables 8a, 8b and 8c.

2.4. Livestock and Poultry

Livestock and poultry raising are flourishing in Rizal because of the good market potentials. The meat, poultry and egg requirements of Metropolitan Manila are partly supplied by the province. There are a number of large swine and poultry enterprises in the province in addition to the conventional backyard raising. The town of Pateros was once called the 'balut basket' of the country.

The number of livestock and poultry in the province if referred to the 1960 inventory are shown in Table 9a and 9b. These figures, however, tremendously increased with the recent establishment of big-scale swine and poultry enterprises. Examples are the Robina and the H&N farms which integrated farm business ventures and can be considered as two of the biggest in the country today.

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Table 8a. AREA PLANTED AND PRODUCTIVITY OF DIFFERENT CROPS. RIZAL. 1960.

Crops	Area Planted (ha)	Productivity (per ha)
1. Rice (cavans, 44 kg)	15,046	35
First crop, lowland	11,462	37
Second crop, lowland	1,355	40
Upland or Kaingin	2,229	23
2. Mango (kg)	616	2,113
3. Corn (cavans, 57 kg)	543	17
4. Banana (kg)	526	3,974
5. Coconut (nuts)	272	1,467
6. Green Corn (kg)	178	1,296
7. String Beans (kg)	136	360
8. Cassava (kg)	124	2,177
9. Peanuts (kg)	110	784
10. Siniguelas (kg)	57	4,222
11. Papaya (kg)	56	4,713
12. Coffee, arabica (kg)	45	255
13. Caimito (kg)	41	2,247
14. Coffee, other var. (kg)	34	56
15. Santol (kg)	31	2,727
16. Tobacco, native (kg)	1	366

Source of basic data: 1960 Census of Agriculture.

Note. Figures presented in this table are for the 26 municipalities and 3 cities.

Table 8b. AREA AND PRODUCTIVITY OF DIFFERENT CROPS. RIZAL. 1960

Crops	Area (ha)	Productivity (kg/ha)
LEGUMES:		
Batao	3.6	1,349
Mongo	3.3	544
Cowpea (Paayap)	1.8	1,250
Lima Beans (Patani)	1.0	5,686
Siguidillas	0.3	2,700
	10.0	
TUBER AND ROOT CROPS:		
Camote	86.9	1,919
Gabi	34.0	1,139
Galiang	0.7	1,512
	121.6	
LEAFY FLOWER AND STEM VEGETABLES:		
Mustard	1.9	1,802
Celery	1.9	969
Pechay	1.8	3,921
Lettuce	1.8	1,450
Camote Tops	1.1	3,981
Libata (alogbate)	0.5	432
	9.0	
FRUIT VEGETABLES:		
Eggplant	56.0	2,178
Tomato	32.4	2,292
Patola	6.1	1,282
Ampalaya	4.6	1,201
Squash	2.0	7,014
Gourd (Upo)	*	-
	101.1	

* Area planted is less than 0.05 hectares.
Source of basic data: 1960 Census of Agriculture

Table 8c. AREA AND PRODUCTIVITY OF TREE AND CULTIVATED FRUITS, OTHER TREES AND PALM CROPS. RIZAL. 1960.

	Fruit Trees	Area (ha)	Productivity (kg/ha)
1.	Mandarin	71.6	571
2.	Orange (Dalandan)	37.6	1,882
3.	Jack Fruit (Langka)	34.8	113
4.	Pineapple	23.8	4,005
5.	Avocado	16.6	740
6.	Cashew	14.5	583
7.	Kalamansi	9.2	827
8.	Chico	7.7	1,535
9.	Sugar Apple (Atis)	4.5	1,047
10.	Pomelo (Suha)	4.5	4,276
11.	Tamarind	4.5	3,936
12.	Guava	3.7	1,059
13.	Manzanita	3.0	162
14.	Duhat	2.6	97
15.	Lanzones	2.4	1,882
16.	Soursop (guayabano)	1.5	1,324
17.	Bread Fruit (Rimas)	0.5	542
18.	Custard Apple (Anonas)	0.5	636
19.	Mabolo	0.4	3,090
20.	Canistel	0.3	854
21.	Macopa	0.2	5,720
22.	Bread Fruit (Camansi)	0.1	1,960
23.	Kamias	0.1	2,600
24.	Galo	*	-
25.	Grapes	*	-
26.	Kamachile	*	-
27.	Carambola	*	-
	Total	244.6	

*Area planted for each farm reporting is less than 0.05 hectare.

Source of basic data: 1960 Census of Agriculture

Table 9a. NUMBER OF LIVESTOCK. RIZAL. 1960.

	Municipality	Carabaos	Cattle	Hogs	Horses	Goats	Sheep
1.	Angono	401	26	525	8	6	-
2.	Baras	452	9	452	11	2	-
3.	Binangonan	1,110	184	3,092	18	238	-
4.	Cainta	620	-	770	5	4	-
5,	Cardona	723	132	808	-	32	-
6.	Jalajala	975	138	776	2	56	9
7.	Montalban	1,382	332	957	86	40	-
8.	Morong	1,895	50	1,689	24	24	-
9.	Pililla	1,793	47	1,484	97	21	-
10.	San Mateo	634	15	885	18	14	-
11.	Taguig	1,074	-	585	15	3	-
12.	Tanay	1,310	635	1,294	83	265	-
13.	Taytay	448	1	810	7	33	-
14.	Teresa	1,547	-	1,163	6	1	-
15,	Antipolo	2,644	63	1,591	69	25	-
16.	Las Pinas	1,198	-	634	25	27	-
17.	Marikina	1,019	-	1,433	64	149	15
18.	Muntinglupa	984	13	1,131	120	339	-
19.	Pasig	710	84	2,238	191	156	-
20.	Pateros	415	39	817	164	67	-
	Rizal	21,334	1,768	23,134	1,013	1,502	24

Source of data: 1960 Census of Agriculture.

Table 9b. NUMBER OF POULTRY. RIZAL. 1960

	Municipality	Chicken	Ducks	Geese	Turkeys	Pigeons
1.	Angono	14,543	41,391	43	32	207
2.	Baras	5,837	12,509	4	-	5
3.	Binangonan	25,688	101,612	52	23	568
4.	Cainta	5,569	471	2	-	5
5.	Cardona	33,062	30,107	16	12	536
6.	Jalajala	7,942	17,028	5	-	70
7.	Montalban	24,954	208	79	-	-
8.	Morong	59,616	27,758	6	36	44
9.	Pililla	11,353	11,571	-	-	-
10.	San Mateo	21,949	-	-	-	-
11.	Tagig	12,949	22,250	7	-	76
12,	Tanay	20,741	11,164	9	-	13
13.	Taytay	6,757	400	-	-	-
14.	Teresa	21,818	304	-	9	-
15.	Antipolo	26,018	416	46	60	189
16.	Las Pinas	9,773	540	29	67	343
17.	Marikina	20,323	839	-	-	-
18.	Muntinglupa	33,642	12,944	43	36	47
19.	Pasig	31,466	66,795	16	-	105
20.	Pateros	14,060	3,732	13	-	97
	Rizal	408,060	362,039	370	275	2,305

Source of data: 1960 Census of Agriculture.

2.5. Tenure Status

The farm operators in the province are mostly owners, share-tenants or part-owners. Around 30 per cent of the farms are fully owned by farm operators, 19 per cent are part-owners and 35 per cent are share-tenants as seen in Table 10. A high degree of tenanted areas is prevalent in Jalajala, Pililla, Las Pinas and Marikina. It is said that Jalajala is a big landed estate or hacienda, thus, ownership of farms by operators is very insignificant in the area.

Likewise, the number of farms shows the same trend as in farm area. The area of farms by tenure of farm operator is given in Table 11.

2.6. Population and Income

2.6.1. Population

Population count in 1960 for Rizal was 349,558 (less 3 cities and 6 municipalities). During the current year 1968, it is estimated that the population to be 440,749 with the present rate of population growth of 2.94 per cent as in Table 12.

As a comparison, the total population with 3 cities excluded, was 780,176 in 1960 while the projected population in 1968 is 982,648. Because population plays a major role in urbanization, the six municipalities were only

Table 10. PERCENTAGE DISTRIBUTION OF TENURE STATUS OF FARMERS, BY MUNICIPALITY. RIZAL. 1960.

	Municipality	Total		Full Owner	Part Owner	Lease Tenants	Share Tenant	Others
1.	Angono	100	(289)*	53	2	1	30	14
2.	Baras	100	(270)	25	25	-	30	20
3.	Binangonan	100	(682)	31	22	1	45	1
4.	Cainta	100	(153)	84	13	-	1	2
5.	Cardona	100	(432)	74	14	-	11	1
6.	Jalajala	100	(391)	3	1	-	85	11
7.	Montalban	100	(593)	10	2	1	50	37
8.	Morong	100	(1,228)	46	37	2	11	4
9.	Pililla	100	(486)	3	22	-	73	2
10.	San Mateo	100	(321)	-	-	4	69	27
11.	Taguig	100	(444)	29	4	-	45	22
12.	Tanay	100	(784)	66	11	nil	16	7
13.	Taytay	100	(229)	35	17	-	48	-
14.	Teresa	100	(462)	8	19	nil	41	32
15.	Antipolo	100	(576)	61	20	-	16	3
16.	Las Pinas	100	(357)	20	-	1	79	-
17.	Marikina	100	(366)	7	3	4	81	5
18.	Muntinglupa	100	(297)	23	1	1	25	50
19.	Pasig	100	(449)	77	3	-	15	5
20.	Pateros	100	(93)	8	9	-	77	6
	Rizal	100	(8,902)	36	14	1	38	11

*( ) Figures in parentheses are number of farms.

Source of basic data: 1960 Census of Agriculture

Table 11. AREA OF FARMS BY TENURE OF OPERATOR, BY MUNICIPALITY. RIZAL. MAY 1960

	Municipality	Total Area (ha)	Full Owner (ha)	Part Owner (ha)	Lease Tenant (ha)	Share Tenant (ha)	Other Forms (ha)
1.	Angono	258	67	19	2	149	20
2.	Baras	483	130	171	-	106	75
3.	Binangonan	724	228	376	4	106	nil
4.	Cainta	306	246	56	-	nil	3
5.	Cardona	842	453	276	-	100	11
6.	Jalajala	723	1	4	-	609	108
7.	Montalban	907	48	31	4	424	400
8.	Morong	2,297	1,181	872	19	161	64
9.	Pililla	1,112	32	336	-	744	1
10.	San Mateo	817	-	-	4	451	292
11.	Taguig	882	178	98	-	449	158
12.	Tanay	3,984	2,900	675	11	300	98
13.	Taytay	987	273	330	-	383	-
14.	Teresa	863	54	290	2	263	254
15.	Antipolo	1,801	1,003	410	-	180	207
16.	Las Pinas	752	79	-	3	643	27
17.	Marikina	791	33	57	42	617	42
18.	Muntinglupa	965	116	8	6	139	696
19.	Pasig	906	528	232	-	130	16
20.	Pateros	84	10	33	-	30	10
	Rizal	20,482	7,562	4,275	178	5,983	2,590

Source of data: 1960 Census of Agriculture

Table 12. POPULATION COUNT IN 1960 AND PROJECTED SERIES UP TO 1970. RIZAL. 1968.

Year	26 Municipalities	20 Municipalities
1960	780,176	349,558
1961*	803,113	359,835
1962*	826,725	370,414
1963*	851,031	381,304
1964*	876,051	392,514
1965*	901,807	404,054
1966*	927,320	415,933
1967*	954,583	428,161
1968*	982,648	440,749
1969*	1,011,538	453,707
1970	1,041,277	467,046

*Rate of population growth is 2.94 per cent.

partially included in the program the fact that they compose more than one-half of the total population. This criterion was used in selecting the 20 municipalities as priority areas.

Data on population are used in estimating the food requirements of the country. It is necessary that a tie-up between agricultural production and food consumption must exist. A province aspiring for development lays emphasis on the availability of food supply to meet the increasing level of living. Such has been the number one target of any economic planning. Agriculture, as source of food supply, must leap forward or keep in pace with population growth.

What is the per capita rice consumption of an average Filipino? From the results of May 1958 survey* on consumption of rice and corn, it gave the following information on household consumption of rice.

		Per Cent
Total household consumption of rice		100
Consumption for food	-	94
For animal and poultry feed	-	2
For commercial use	-	3
For other purposes	-	1
Annual average per capita rice consumption in sacks of 56 kilos milled rice		1.95

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* Based from Household Food Nutrition Surveys, Food and Nutrition Research Center, NIST, NSDB. May 1958.

It was also estimated that the rice-eating population is 76.o per cent and the corn-eating population is 20.8 per cent.

A comparison of the estimated rice consumption in eight regions of the Philippines is shown in Table 13.

2.6.2. Farm Labor Force

Farm labor force includes persons who are 10 years of age or over and are economically active. An analysis of the 1960 Census data reveals that Morong, Tanay and Binangonan have the most number of farm labor force. This trend accordingly follows the proportion of hectarage being cultivated. On the average, the farming population of Rizal is very limited at only 24 per cent of the total population and the available farm labor force is around 66 per cent of the farming population.

The geographical location of towns in the province greatly affects the distribution of farm labor force. The towns particularly affected are Pasig, Pateros, Marikina, Taytay and Cainta whose farm labor force ranges from 5 to 13 per cent of the total labor force. The main reason for such a decrease is the opportunity of employment in industries which are predominant in Greater Manila and nearby areas.

The population count and farm labor force based on 1960 Census of Population is seen in Table 14.

Table 13. ESTIMATED RICE CONSUMPTION
IN EIGTH REGIONS. PHILIPPINES*

Region	Rice Consumption kg/cap/yr	Rice Consumption gr/cap/day
1. Central Luzon	154.8	424.1
2. Ilocos - Mt. Province	143.0	391.8
3. Bicol	142.3	389.9
4. Southern Tagalog	112.6	308.5
5. Cagayan Valley - Batanes	97.6	267.4
6. Metropolitan Manila	87.7	240.3
7. Western Visayas	87.6	240.0
8. Eastern Visayas	54.7	149.9

*Source: Nutrition Survey in different region of the Philippines. Food and Nutrition Research Center. Manila.

Table 14. POPULATION AND FARM LABOR FORCE. RIZAL. 1960.

	Municipality	Population Count (number)	Farming Population (number)	Farm Population to Total Population (per cent)	Est. Farm Labor Force
1.	Angono	7,093	1,855	26	1,243
2.	Baras	4,454	1,831	41	1,1190
3.	Binangonan	31,274	4,476	14	2,909
4.	Cainta	6,803	861	13	560
5.	Cardona	12,476	2,970	24	1,960
6.	Jalajala	5,223	2,422	46	1,526
7.	Montalban	9,648	3,484	36	2,299
8.	Morong	13,694	6,803	50	4,558
9.	Pililla	9,021	2,794	40	1,872
10.	San Mateo	12,044	2,054	17	1,356
11.	Taguig	21,856	3,132	14	2,098
12.	Tanay	13,955	4,439	32	3,019
13.	Taytay	21,747	1,633	8	1,110
14.	Teresa	4,928	2,974	60	1,993
15.	Antipolo	21,598	4,441	21	2,798
16.	Las Pinas	16,093	2,352	15	1,552
17.	Marikina	40,455	2,505	6	1,703
18.	Muntinglupa	21,893	2,122	10	1,379
19.	Pasig	62,130	2,930	5	1,992
20.	Pateros	13,173	710	5	483
	Rizal	349,558	58,791	24	37,600

Source of basic data: 1960 Census of Population

2.6.3. Income

The inherent proximity to Greater Manila is the principal reason Rizal province is very progressive. Because of its nearness to Manila, industrial sites and commercial centers have been established which largely contributes to the income of the province. Also, the progress is attributable to the political leadership of the provincial government. The province of Rizal has the reputation of having one of the soundest fiscal policies in provincial administration. The money of the government is being tapped to full utility. Some of the examples are the construction of infrastructures as a province-wide program. The Rizal Economic Development Commission vies for further economic upliftment and the Agricultural Development Council for Rizal forwards rural development which are both concrete proofs of effective utilization of funds. The income of the province for Fiscal Years 1954 to 1966 is shown in Table 15.

The income is a vital ingredient in promoting agricultural development of the province. The province can make use of the Agricultural Fund for harnessing the development of agriculture. The accummulated and unexpended balances of the Agricultural Fund created by Commonwealth Act No. 85, (as amended by Commonwealth Act No. 649, Re-

Table 15. INCOME AND EXPENDITURE FOR FISCAL YEARS 1954 - 1966. PROVINCE OF RIZAL. 1967.

Fiscal Year	Income	Expenditure	Surplus
1953-54			₱ 310,201.87
1954-55 + Surplus	₱ 4,060,528.99	₱ 3,780,452.12	280,076.87
1955-56 + Surplus	4,619,055.52	4,142,408.51	476,647.01
1956-57 + Surplus	5,104,937.33	4,679,593.75	425,343.58
1957-58 + Surplus	5,446,058.63	5,023,865.89	422,192.74
1958-59 + Surplus	5,682,176.25	4,878,423.01	803,753.24
1959-60 + Surplus	6,582,050.25	5,248,561.43	1,333,488.82
1960-61 + Surplus	8,702,494.76	7,200,843.66	1,501,651.10
1961-62 + Surplus	11,626,388.28	9,044,855.61	2,581,532.67
1962-63 + Surplus	16,518,541.06	12,503,100.91	4,015,440.15
1963-64 + Surplus	20,422,792.05	13,392,253.73	7,030,538.32
1964-65 + Surplus	25,468,976.49	15,401,474.77	10,067,501.73
1965-66 + Surplus	30,910,918.39	16,179,917.38	14,731,001.01

Source of data: Office of the Governor

public Act No. 3844) are appropriated for the financing of present agricultural projects.

However, to assure success in the implementation of the agricultural development program of the province, the ADCR must be given the necessary authority and discretion in the utilization of funds that may be available. During the early operation of the Council, this authority became a puzzle. On November 14, 1966, by virtue of Executive Order No. 15, the Office of the President of the Philippines temporarily granted ADCR the authority and discretion in utilizing the Agricultural Fund of the province. Such will be enforced for a period of five years.

III. AGRICULTURAL DEVELOPMENT COUNCIL FOR RIZAL

3.1. Organization

The area development concept is now accepted by the provincial and local leaders as capable of hastening the growth of Philippine agriculture. Under this concept, projects can be undertaken by forming a council with all the resources and services for agricultural development. A council can provide the mechanism which would supplement the services of various agencies or provide them with institutional framework for development. The initiation of an area development program, say on a provincial level, is greatly influenced by its potentials for agricultural development, interest of the provincial government and of course, the capital resources for implementation. Essentially, area development lives on the premise that provincial and local leaders are in a better position to understand their problems and needs.

It is with this idea that the Agricultural Development Council for Rizal (ADCR) came into existence. The Provincial Board of Rizal, by virtue of Resolution No. 466 dated March 30, 1966 created ADCR. Through the initiative of Governor I. S. Rodriguez, the ADCR was organized to plan and carry out agricultural development program for the province including provisions for technical and financial assistance to farmers. The creation of ADCR does not only show the excellent political leadership of the incumbent Governor, but it also demonstrates his concern and keen interest in development and solution of the problem of agricultural development in the province. The Council was proposed to be quasi-government in nature in carrying out the objectives of the program. It is somewhat independent of governmental lines of authority and operates on its jurisdictional competence. Such is aimed to obviate the difficulties of red tape which is inherent in most bureaucratic set-ups. The Council thus, acts with dispatch to meet local needs. Above all, the Council is given the freedom to establish suitable procedures of its own.

The Council consists of five members; a representative each from the Office of the Governor, Department of Agriculture and Natural Resources, National Economic Council, Rice and Corn Administration and Agricultural Productivity Commission. The U.P. College of Agriculture sits with the Council in all its deliberations in an advisory capacity and provides technical assistance in major areas of operation. The U.P. College of Veterinary Medicine, the Chairman of the Rizal Economic Development Commission, and a represeentative from the farmer's group composes the advisory body for the Council.

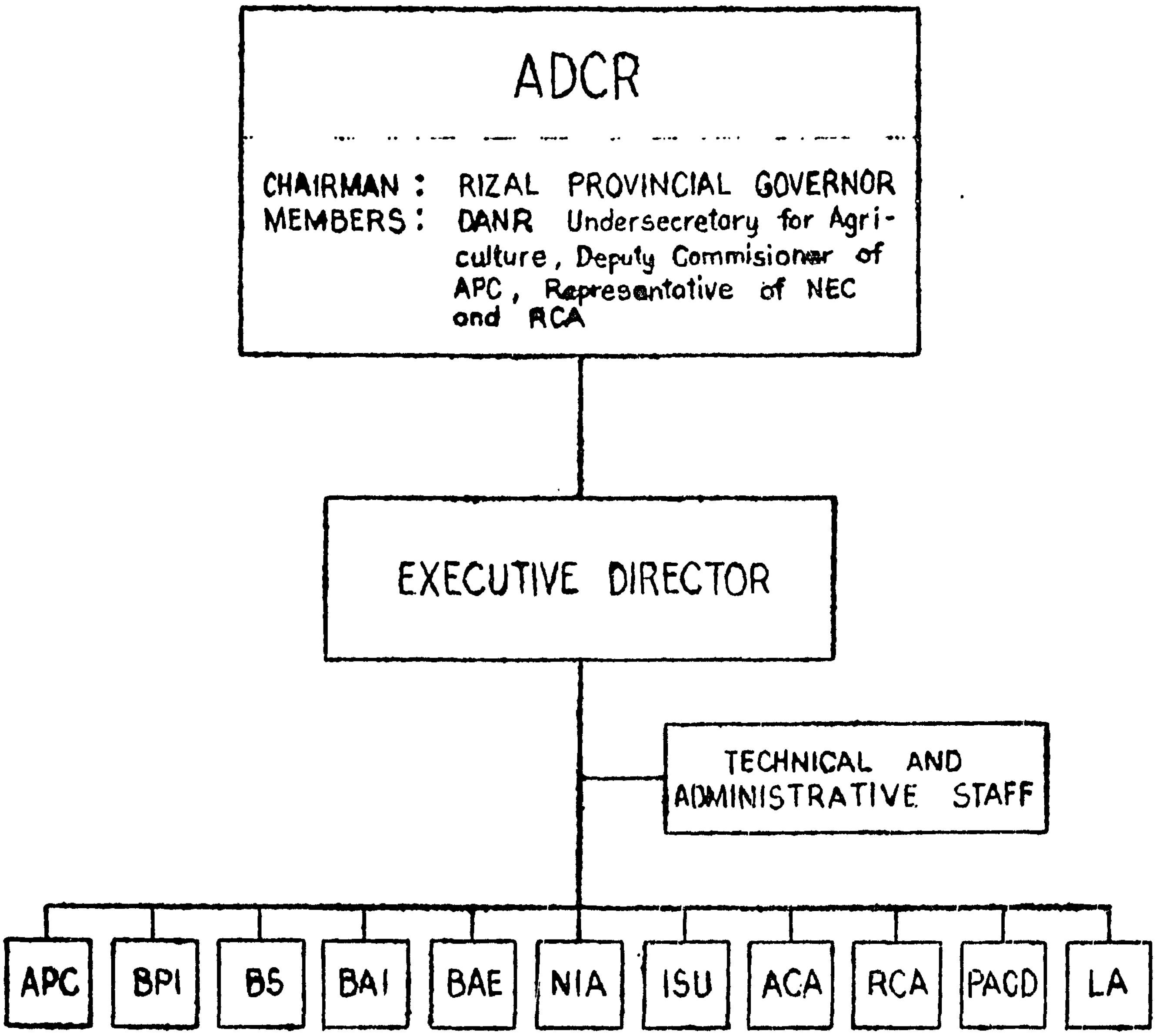
The Council serves as the policy_governing body and undertakes specific plans for implementation, allocates the resources available for the program, and facilitates implementation of the program. The Council also handles all the necessary external arrangement with the various national agency heads.

The Executive Director is responsible for the implementation of policies, plans, program and project initiated or approved by the Council. A technical and administrative staff assists the Executive Director. Special arrangements were made so that the Council can have the power of control and coordination of activities of all personnel of various agricultural agencies, offices and instrumentalities on the provincial level. National agencies are specifically the Agricultural Productivity Commission (APC), Bureau of Soils (BS), Bureau of Plant Industry (BPI), Bureau of Animal Industry (BAI), Bureau of Agricultural Economics (BAE), Presidential Arm on Community Development (PACD), National Irrigation Administration (NIA), Irrigation Service Unit (ISU), Agricultural Credit Administration (ACA), Rice and Corn Administration (RCA) and Land Authority (LA). These agencies are under the jurisdiction of the Council in so far as their activities within the province are concerned.

The organizational chart of the ADCR is shown in Figure 3.

Figure 3.

ORGANIZATIONAL CHART


ADCR
CHAIRMAN : RIZAL PROVINCIAL GOVERNOR
MEMBERS : DANR Undersecretary for Agriculture, Deputy Commisioner of APC, Representative of NEC and RCA
EXECUTIVE DIRECTOR
TECHNICAL AND ADMINISTRATIVE STAFF
APC
BPI
BS
BAI
BAE
NIA
ISU
ACA
RCA
PACD
LA

PLEASE RETURN TO ORD

3.2. Functions

With the establishment of the ADCR, it is expected that more effort will be exerted by government agencies and local governments in the development of agriculture. The essential resources and services can be made available in order to support their efforts. There is a system whereby it can supplement the services of various agencies thus, providing the institutional framework for agricultural development.

The main functions of the Agricultural Development Council for Rizal are as follows:

a. Formulate plans, policies and operation procedures with some broad guidelines for agricultural development as envisioned initially by the Council;

b. Prepare budgetary proposals indicating major areas of work and the general nature of the proposed projects with each area;

c. Determine the technical and economic feasibility of proposed projects;

d. Provide technical assistance to government agencies responsible for agricultural development in the implementation of projects;

e. Initiate and carry out development projects when government agencies in the province are not capable of doing so;

f. Facilitate the gathering and analysis of data as basis of benchmark information and in the evaluation of development projects;

g. Administer expenditures of funds allocated to its use; and

h. Perform other functions pertinent in the development of agriculture in the province.

The specific objectives of the agricultural development program in Rizal are enumerated as follows:

a. Activate farmers' minds, human energies and natural resources of the province into more productive ventures in order to attain a rapid rate of agricultural development;

b. Provide the concomitant government services essential to development;

c. Expand overall agricultural production and effect improvements in productivity; and

d. Increase the income from farming to allow a dignified level of existence from such a pre-occupation.

3.3. *Staffing Pattern*

3.3.1. *ADCR*

The staff of the ADCR is composed of:

a. Technical Group - in-charge with the responsibility on planning and putting into effect a land-use program based on a land capability classification arrived at from the aerial photography obtained on the province as of March 1966. It is also responsible for the development and putting into motion specific crop and livestock.

b. Irrigation Group - in-charge of preparing feasibility studies and surveys for all possible irrigation projects, both gravity and pumps, supervising the construction thereof and assisting in the proper water use management of such projects.

c. Financial Group - responsible for meeting credit requirements of specific crop and livestock projects, irrigation projects and other agricultural plans essential to the successful implementation of the entire program.

d. Marketing Group - in-charge with the responsibility of determining market potentials and price information and supervision of the farmer-owned Rizal Producers Marketing Cooperative, Inc.

e. Cooperative Group - responsible for undertaking the necessary organizational, training and supervisory work to develop farmer associations into farm puttings in order that they can receive assistance for the development of irrigation facilities and eventually to undertake the distribution of production supplies and the marketing of agricultural products. It is also responsible for the organization of credit unions among farmers to develop an alternative source of credit for agricultural development.

f. Statistical Group - responsible for the conduct of a benchmark statistical survey to serve as the basis for designing specific program of operation and to undertake annual surveys thereafter to determine the progress and problems of the overall agricultural program.

g. An Information Group - to take charge in dessiminating to the public the operation of the program in order to attain public understanding and acceptance. It is also responsible for bringing to farmers specific information as maybe required by the operation of the program.

h. Field Operations Group - in-charge with the responsibility of determining public reaction to the program, discovering problems and anomalies in undertaking special tasks.

i. Administrative Group - responsible for seeing to it that the entire administrative organization works efficiently at the fastest possible rate.

3.3.2. Government Services

a. Agricultural Productivity Commission - shall be responsible for providing technical assistance and guidance to individual farmers and his farm family:

1) Farm Management Technician - provides direct technical assistance to individual farmers in the production of his crops and livestock. He will also analyze production loan applications and shall recommend to the Rural Bank approval of these loans. He shall likewise be responsible in seeing to it that the recipients of loans obtained from Rural Bank comply with their obligations in paying such loans.

2) Home Management Technician - will be responsible in instituting a system of farm accounting and record keeping through technical assistance provided to rural housewives in order that whatever additional income which will be released to farmers for the implementation of the program may be directed to the most benificial purposes. They will also be responsible for collecting local price information which will be utilized for the implementation of the marketing program.

3) Rural Youth Officer - shall be responsible for re-orienting young minds towards the principles promulgated by the Agricultural development program and providing farm initiating information of future farmers to the program.

b. Bureau of Plant Industry - composed of Plant Pest Control Officers and Seed Inspectors who use the implied identities and they shall be responsible for the following:

1) Pest and disease control on an area site basis. They shall be responsible for planning and implementing a rat control program and prevention of outbreak of army worms and to control pests and diseases. They shall serve as a technical support to the Farm Management Technician who shall be in direct contact with farmers.

2) Seed Inspection Certification - The BPI personnel shall be responsible for undertaking field inspection of seed production plots, seed testing and certification and assistance to the Rizal Producers Marketing Cooperative Incorporated for the proper discharge of its activities.

3) Supervision of farm machinery - purchased from loans obtained from the Rural Bank under the credit arrangements of the program.

c. Bureau of Soil - Their personnel shall be responsible for the following:

1) Determination of technical facilities for the proposed irrigation projects based on the characteristics of the soil.

2) Establishment of fertilizer trials in cooperation with the farm management technician to determine the fertilizer requirements of specific areas.

3) To obtain soils samples to delineate an area belonging to the said dealers to serve as the basic from the general ferilizer recommendation.

4) To develop soil map and fertilizer recommendation map based on the above.

d. Bureau of Animal Industry - Personnel of this agency shall have the responsibility of:

1) Planning and implementing of specific livestock projects.

2) Providing regulatory services.

2) Providing regulatory services.

3) Operating the breeding center.

e. Bureau of Agricultural Economics - shall use the statistics group of the Council in conducting the necessary survey.

f. National Irrigation Administration - shall be responsible for the following:

1) Undertaking investigation of gravity irrigation sites.

2) Preparing feasibility study and constructing plans.

3) Supervising construction of gravity irrigation projects.

4) Providing assistance in water management.

g. Irrigation Service Unit - shall be responsible for:

1) Developing feasibility studies for pump irrigation.

2) Supervising construction of this system.

3) Providing assistance on proper water management of pump irrigation.

h. Agricultural Credit Administration - shall be responsible for:

1) Assisting in the implementation of the credit program.

2) Assisting in the establishment of a supply distribution system.

3) Assisting in the marketing phase of the program.

i. Rice and Corn Administration - shall be responsible for:

1) Institution and operation of quedan systems of buying rice and corn.

2) Providing a market for the palay seed to be produced by the province.

3) Assisting in the collection of loans provided by the Council and the Rural Bank.

j. Presidential Arms on Community Development

1) Shall be responsible for developing municipal and barrio governments into payable organization which can be utilized for the planning and execution of specific projects.

2) Organizing the necessary group efforts in undertaking specific task such as road building, improvement of irrigation canals and local participation in the rat control program to be supervised by the BPI.

3) Establishment of centers in the municipalities who serves as offices of various personnel of technical agencies and various farmer association.

4) Assisting in the organization of farmer associations and credit unions.

5) Establishment of system of providing ID cards.

6) To serve as clearing house of all meeting to be called in any place in the province.

k. Land Authority - shall synchronize its activities with the policies and operation of the Provincial Agricultural Development Program.

3.4. Development Scheme

Before planning a development program, the prevailing conditions of the province must first be known. Statistical information of the area under consideration provides a basis for making plans and decisions. Some of the pertinent agricultural information about the province were discussed already in Chapter II. In the present development scheme, the following were considered in making plans and policies:

a. Limited Agricultural Land

Of the estimated total land area which is 149,319 as in Table 1, only 19,466 hectares is available for farming covering 8,902 farms. The area planted to rice is 13,028 hectares with a total number of 7,041 farms. Because of the limited area for agricultural development, agricultural production could be intensified for increased productivity. Expansion of agricultural land is no longer possible and necessary. A small area for development can mean the utilization to the fullest extent of the available resources and lessen expenditure in the implementation of the program.

b. Proximity of Greater Manila Area

Geographically, some municipalities of Rizal Province are included in Greater Manila Area*.

b. Proximity of Greater Manila Area

Geographically, some municipalities of Rizal Province are included in Greater Manila Area*. (See also discussions in Section 2.1. and Figure 1.). This factor should be considered in interrelating the input-output factors of production which becomes a major problem in increased agricultural productivity. The Greater Manila market is the best source of production inputs such as chemicals, fertilizers, etc. and also a good market outlet for the produce of Rizal province.

c. Shifting of Labor Force to Industry

There are many factors involved in the shift of farm labor force to industry. The establishment of more industries in municipalities bordering Greater Manila Area is very evident source the province is adjacent to Manila. These industrial establishments offer more lucrative jobs than farming. The limited area for expansion in agricultural development leads to mechanization of farms which requires a large capital investment unafforded by the ordinary farmer, thus, again, the shift of labor force to industry.

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* Greater Manila area comprises the cities of Manila, Pasay, Quezon and Caloocan and the municipalities of Paranaque, Makati, Mandaluyong, Marikina and San Juan of Rizal Province.

d. Small size farms

The average landholding in the province is approximately 1.5 hectares almost half the national average of 3 hectares. Figure 4 shows the distribution of farms according to size. (See also Table 16). If this condition exists, then it is easier to intensify agricultural production. Labor-use can become more effective and excess farm labor could be shifted to meet the requirements of industry. Small size farms would, however, mean more effort in supervision of agricultural program activities because of the large number of farms.

e. Relatively high levels of productivity

According to the 1960 Census of Agriculture, the production of palay is 35 cavans per hectare which is comparatively higher than the national average of 27 cavans. Not very lately, with the impact of agricultural technology in the province, rice productivity reached 56 cavans per hectare in 1966. The reasons for the relatively high levels of rice productivity is the acceptance of scientific methods of rice farming by a number of productive farmers in the provice. Thus, it can be said that even before the creation of the ADCR, technological changes in the farms

PLEASE RETURN TO CRD

Figure 4. Percentage Distribution of Number and Area of Farms, By Size of Farm. Rizal. 1960.

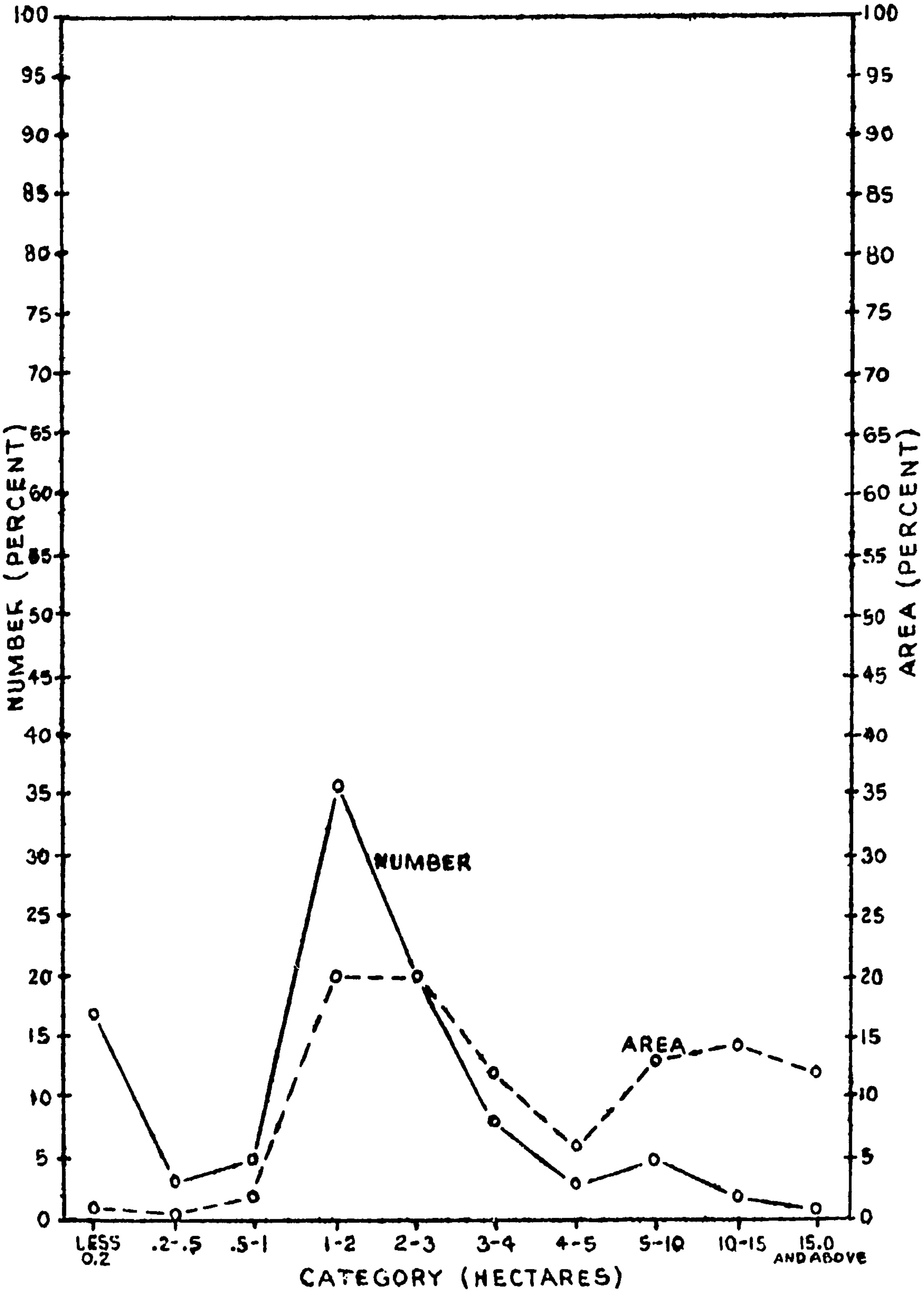


Table 16. NUMBER AND AREA OF FARMS BY SIZE OF FARMS. RIZAL. 1960.

Category in Hectares	Number of Farms		Per Cent	Area of Farms (Ha.)		Per Cent
Total	10,522		100	22,989		100
Less than 0.2	1,814		17	181		1
0.2 - 0.5	297		3	79		nil
0.5 - 1.0	559		5	345		2
1.0 - 2.0	3,476		36	4,618		20
2.0 - 3.0	2,052		20	4,486		20
3.0 - 4.0	852		8	2,712		12
4.0 - 5.0	343		3	1,432		6
5.0 -10.0	482		5	3,062		13
10.0 -15.0	295		2	3,226		14
15.0 -20.0	30	82	1	478	2847	12
20.0 -25.0	23			521		
25.0 -50.0	20			614		
50.0-100.0	4			257		
100.0-200.0	4			559		
Over 200	1			418		

Source of basic data: 1960 Census of Agriculture.

PLEASE RETURN TO CRD

have already started subsequently with industrial growth in the urban sector.

The scheme of agricultural development based on the above prevailing conditions evolves on the following as evisioned by the ADCR:

a. Full development of potential water resources

The most important factor in the success in rice production is the availability of irrigation water. According to the 1960 Census of Agriculture, the area of farms under irrigation is only 2,128 hectares. The target of ADCR program calls for at least trebling the irrigated area. Unfortunately, no big potential water sources can be tapped in the province. In this connection, all possible water sources in the province must be surveyed and utilized. Feasibility studies for pump and irrigation projects are currently conducted. The ADCR also finances the construction of such projects. Technological innovations and infrustructures like irrigation systems contribute a lot to agricultural development.

b. Increased level of technology in rice culture through technical assistance supported by:

(1) a seed production and distribution system,
(2) availability of farm supplies, and
(3) adequate credit.

This aspect is discussed partly in Sections 4.2, 4.4 and 4.5. With the coordination of agencies concerned specially APC, BPI, PACD and ADCR staff, educating farmers along scientific can be made possible. Because of the proximity of research institutions and the Manila market, a seed production program can be instituted. At least 1/3 of the seed requirement of the country can be supplied by the province. This can be possible by making available the farm supplies and credit. In the program of ADCR, it is envisioned that a farm supply dealer will be located in every municipality whereby farmers could easily procure the input requirements in rice production. On hand, credit assistance will be coursed through rural banks. Financial assistance of ADCR will be quasi-government in nature whereby the money will be channelled to rural banks and in turn a counterpart will be provided by the bank.

c. Improved labor efficiency with farm mechanization

The employment of one tractor unit in every 100 hectares of farmland greatly improves labor efficiency. The ADCR aims to reach or even surpass this

this mark with the extension of liberal credit on farm machineries in the province. Farm mechanization includes machines for irrigation, land preparation, harvesting and other farm operations. Mechanization of farms increases agricultural production at same cost or even at a lesser cost. It is also effective in the adoption of technological innovations. Cultivation of farms then becomes intensive.

d. Intensify utilization of land by shifting to production of vegetables

The major vegetable-producing provinces are Baguio and Benguet. However, the province of Rizal can readily compete with Baguio because of its proximity to the Manila markets. It is proposed that 1/3 of the vegetable requirements of Manila can be supplied by the province. To this effect, a market study for launching a vegetable program was made by commissioning the Economic Development Foundation to conduct the study for ADCR. The upland areas, where cool climate prevails, will be used for this program. Also, with the availability of water supply in some lowland areas where vegetables are adopted, vegetable planting will be promoted.

e. *Develop livestock enterprises on upland areas*

A livestock and breeding project is part of the agricultural program of Rizal. This project is recommended in upland areas. The dairy project is included and facilities like milk bottling and meat processing plants will have to be constructed. This project could be supplementary to the rice production program.

f. *Develop to the fullest extent possible the potentials of farmer associations*

The farmers of Rizal will be trained to manage their own business. As a start, farmers associations will be organized into cooperatives. The Rizal Producers Marketing Cooperative (RPMC) will set an example of the advantages of organizing a cooperative besides being a training ground for prospective officers of cooperatives. The RPMC is a farmer cooperative; but will be directly administered and supervised by ADCR until such a time that farmers are ready to run their own business.

3.4. Cost of the Program

The total program cost will amount to 8.7 million pesos for a period of 5 years. Of this amount only 1.516 million pesos represents non-recoverable cost which include irrigation survey and design, technical assistance, regulatory services, agricultural survey and administrative cost. All other expenditures will either recoverable or represents fixed investment which could be utilized for extended period. The tentative cost of the program is shown in Table 17.

Of the total amount of ₱8.7 million, ₱5.4 million will be the counterpart of the province in the form of the Agricultural Fund established by Com. Act 85 as amended by Com. Act 249, Republic Act 680 and Republic Act 3844. Of this amount ₱2.6 million is available for expenditures and ₱2.8 million represents future income of the province from Agricultural Fund for the next 5 years. Refer to Table 18.

The amount of ₱1 million is expected to be obtained from the national government to finance the cost of development of the livestock project.

The amount of ₱2.3 million still remain to be obtained from other sources. This amount represents approximately the amount necessary for the establishment

Table 17. TENTATIVE COST OF PROGRAM ADCR. JUNE 1966.

Item	Cost	Benefits
Irrigation Development		
Survey and Design	₱ 116,000	Feasibility studies for all projects
Construction (loans)	2,950,000	2,593 ha. irrigated and rehabilitation of 1,907 ha.
Equity Investment	100,000	Initial capital for for commodity corporation
Deposits	75,000	₱150,000 Commercial Loan to Commodity Corporation
	675,000	₱2,250,000 of production credit to farmers
	100,000	₱200,000 Commercial Loans to farm supply dealers
Advances	280,000	100 units of hand tractors
Farmers Market	2,000,000	Vegetable market for entire province and adjoining areas
Milk Collection Center	1,000,000	1,000 liter capacity bottling plant
Technical Assistance and Regulatory Services	550,000	
Agricultural Surveys	50,000	
Administrative Cost	800,000	
Total -	₱ 8,706,000	

Table 18. SOURCES OF FUNDS. ADCR. JUNE 1960.

Sources	Amount
PROVINCIAL AGRICULTURAL FUND	
Unexpended balance	₱ 600,000
Recently released	1,300,000
Future income	3,500,000
Sub-total -	₱5,400,000
NATIONAL GOVERNMENT	₱1,000,000
ADDITIONAL REQUIREMENTS	2,300,000
Total -	₱8,700,000

and operation of the Rizal Farmer's market.

Therefore, all sources of funds are assured except for the livestock project which has still to be secured but has received the personal commitment of the President for a support amounting to ₱2.3 million for the marketing phase of the program. However, the Provincial Government expect to cover up such requirement in financing if and when the expected sources of funds materialized.

IV. RICE PRODUCTION PROGRAM

In the process of fulfilling its objectives, the ADCR program shows a more rapid rate of agricultural development with all the necessary ingredients provided for. Some of the most important requirements are: (1) irrigation facilities, (2) production credit, (3) farm mechanization, (4) availability of production inputs, (5) seed production distribution, (6) processing and marketing of agricultural products and, of course (7) provisions for financial and technical assistance. The provincial government in order to undertake effectively the development of agricultural resources shall be given the authority to coordinate and supervise the personnel services of the national government agencies and the financing scheme to achieve a progressive program. This will necessitate the involvement of the local cooperation which in the long run would be productive in nation building.

The rice production program of the ADCR is different from the programs carried out by the national government during the past. Many existing policies were changed and proper planning and implementing procedures were instituted. Financial assistance to farmers are channelled to the private rural banking system of the province whereby government complexity in the implementation is completely eliminated.

A Memorandum of Agreement between the ADCR and the Department of Rural Bank of the Central Bank of the Philippines was executed (See Appendices 1a, 1b, 1c, 1d, 1e, 1f, 1g, and 1h) which completely changed the credit structure in agriculture. This agreement has become the basis of financial assistance given by the ADCR in the implementation of its projects.

4.1. Irrigation Development

For agriculture to be developed, irrigation must be made available as a foundation for all farm innovations more specially in rice production. This kind of infrastructure renders irrigated farms more productive than non-irrigated farms. Increased response to production inputs like fertilizer and chemicals is also realized. Besides, more labor and capital are absorbed thereby increasing the yielding capacity of the land. Because of this valid set-up as a contribution to agricultural development, the ADCR took steps for the immediate construction of irrigation structures in pre-surveyed sites in order to increase the area of irrigated land.

National figures indicate that in 1949, the irrigated area planted to palay was only 4.16 per cent but increased only to 7.83 per cent in 1959. This shows that the increase in irrigated riceland was quite limited within the period of 10 years. In Rizal, the primary target of the present agricultural program is to treble the irrigated area devoted to the rice crop. This target could only be accomplished with the construction of more irrigation projects.

Irrigation systems are of two types: the gravity and pump irrigation systems. Presently, these systems are serving mostly the rice farms but eventually, in the province-wide implementation of vegetable program, these system will be of greater use as important sources of irrigation water.

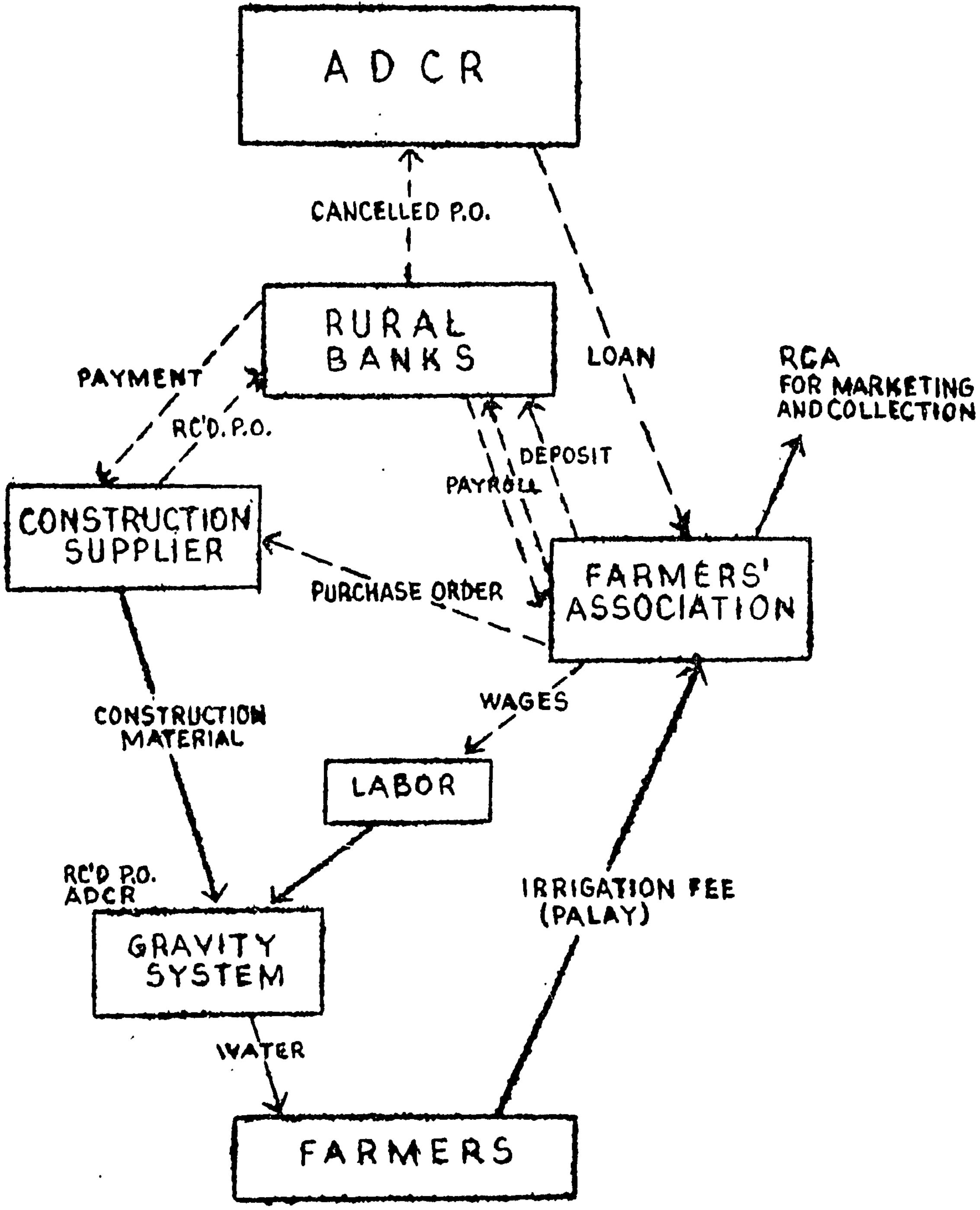
4.1.1. Gravity Irrigation System

The usual policy of providing the investment on gravity irrigation systems as a government grant will be stopped. All forms of financial assistance to farmer associations for the construction or rehabilitation of damaged communal gravity irrigation systems shall be provided as a loan which must be repaid by water recipients.

There are various reasons for the institution of this new policy. Making the investment or irrigation as a responsibility of enduser would encourage greater concern in the operation, maintenance and repair of the system. It will allow greater efficiency and lower costs in the construction of irrigation systems. Furthermore, red tape will minimize to the minimum with the farmer's association directly concerned.

Figure 5.

COMMUNAL GRAVITY IRRIGATION



This procedure will provide a source of forced savings eventually allowing the irrigation associations to accummulate and abling them to diversify into other types of activities such as the distribution of farm supplies and marketing of agricultural products. This will be a source of capital for farmers and farm associations to invest in ownership of agri-businesses.

4.1.2. Pump Irrigation System

To augment the availability of pumps from irrigation Service Unit which is usually very limited, the Agricultural Development Council for Rizal has entered into an agreement with the rural banks of the province to finance the construction of pump irrigation systems. Under the joint agreement with the rural banks, eligible farmer associations and private individuals shall enjoy 90% financing of the total cost of construction of pump irrigation system which are payable within a period of five to seven years.

Under this 90% financing agreement, the rural banks shall provide 50% which maybe rediscounted in the Central Bank from proceeds of loans obtained from the World Bank. This portion of the loan shall be charged 12% interest per annum.

The Agricultural Development Council for Rizal shall advance to the rural bank the remaining 40%. Farmers shall

Figure 6

COMMUNAL PUMP IRRIGATION

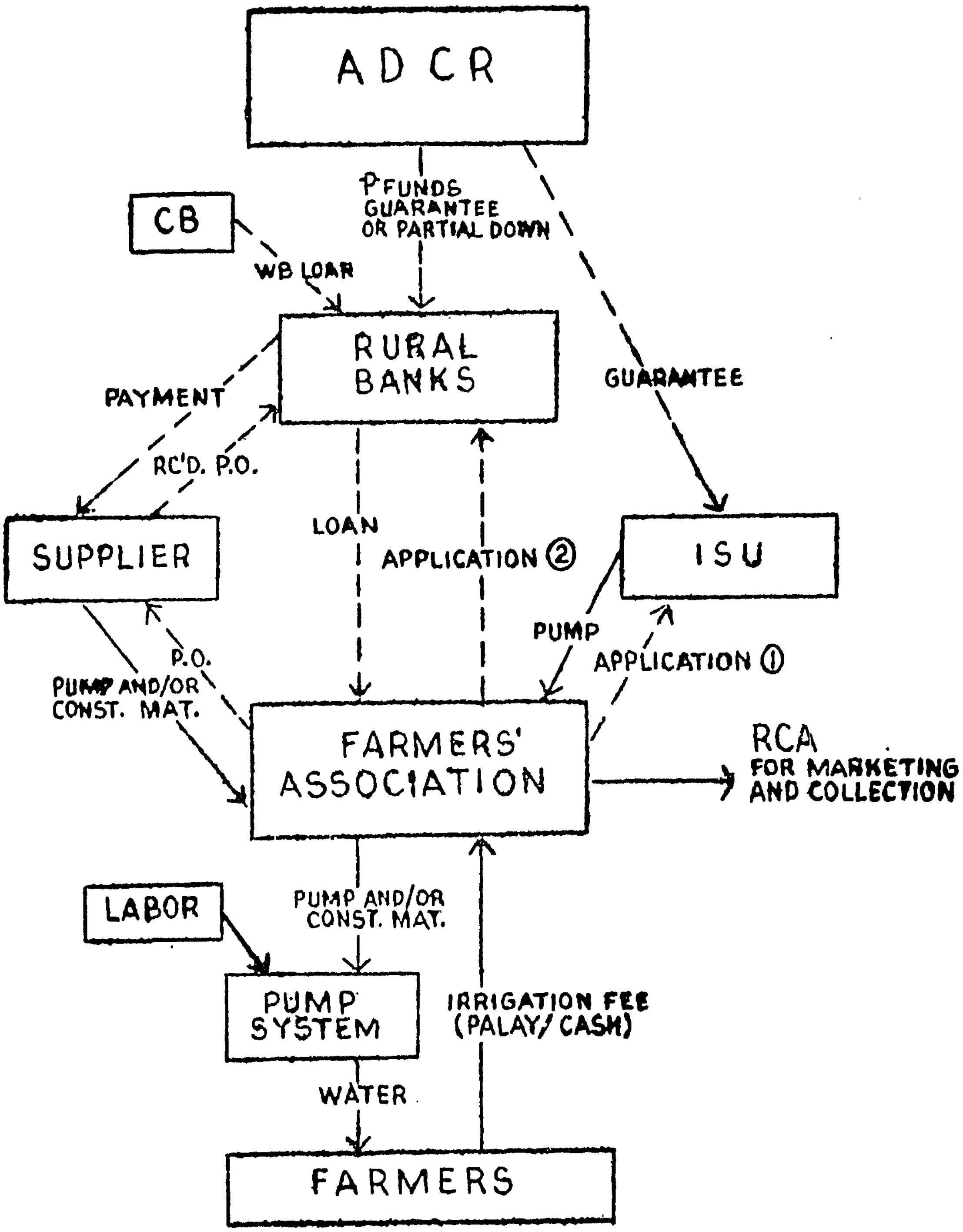
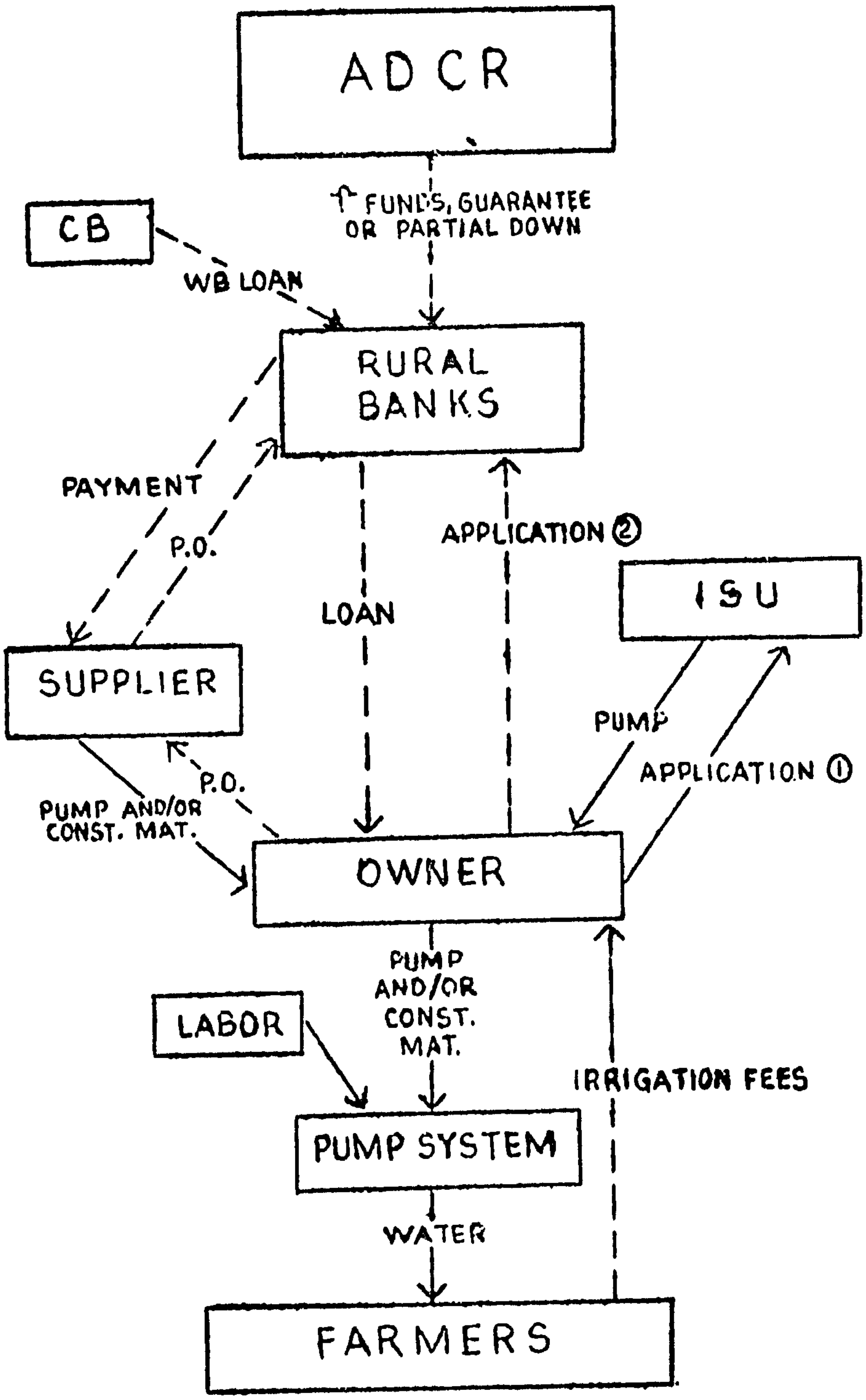


Figure 7

PRIVATE PUMP IRRIGATION



pay only 3% for service charge on these funds. The average interest rate covered then becomes 8% per annum.

Farmers association in order to be able to obtain financial assistance for irrigation must first undergo the necessary organizational and training of manpower through the cooperative group of the ADCR.

4.2. Seed Production

Certified seeds spearhead technological change. The province will produce seeds for its own use. In so doing, surplus seeds can also be sold to other provinces thereby providing farmers additional income from premium prices.

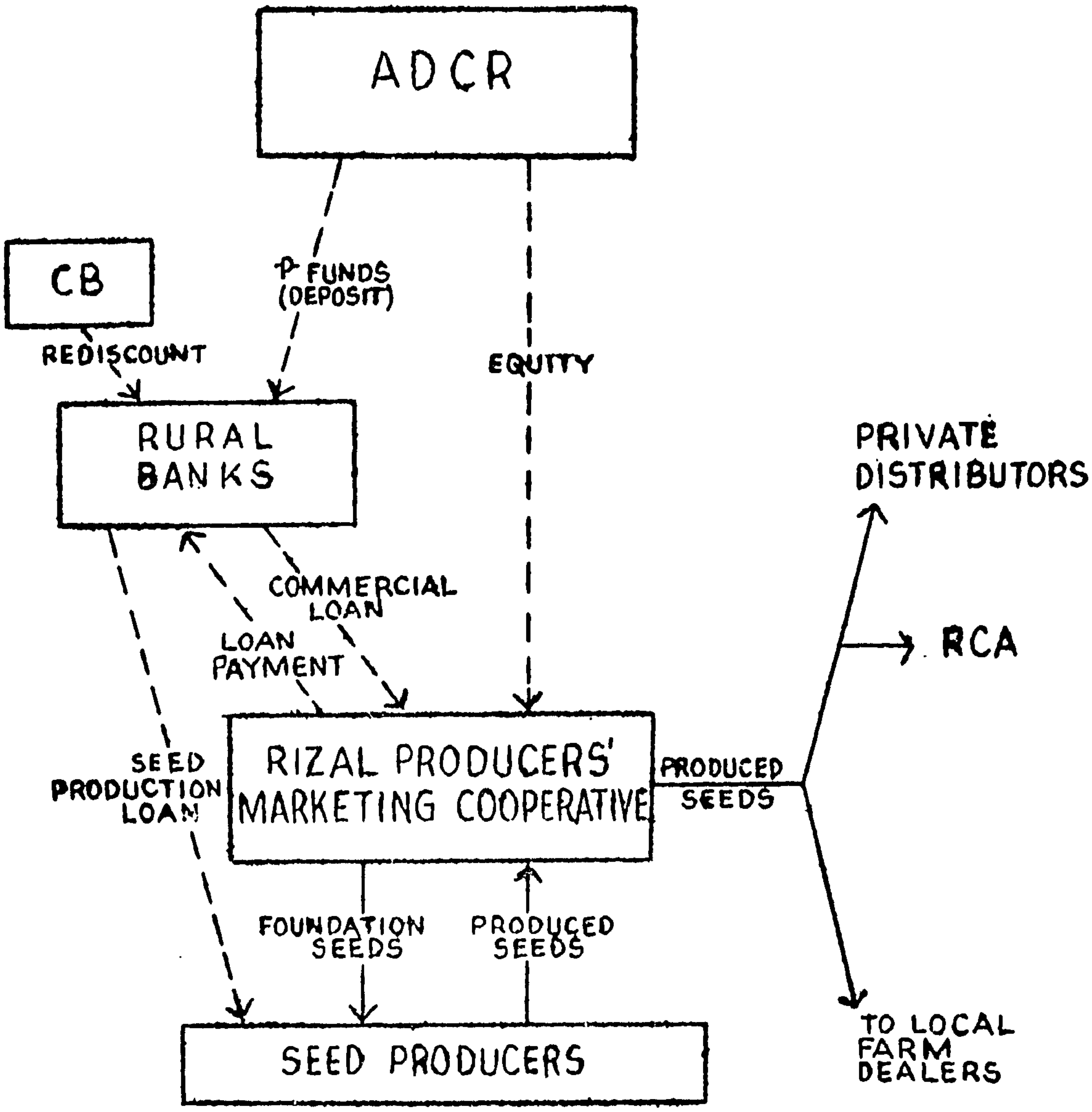
Loans will be obtainable by seed producers from the rural bank. These loans are fully guaranteed by the province. After harvest, a guaranteed price for seeds produced will be provided to seed producers to protect the farmers' interests.

For new and untested seeds, a guaranteed yield shall be provided. In case of crop failure, the difference between the actual harvest and guaranteed yield will be paid to the farmers at a guaranteed price but total payments would not exceed the amount of the loan.

Handling of seeds i.e. trucking, drying, cleaning, warehousing, testing, bagging, and merchandizing shall be taken cared by the Rizal Producers Marketing Cooperative, Inc.

Figure 8.

SEED PRODUCTION
AND
DISTRIBUTION



which shall be farmer-owned and controlled. The capital shall initially be provided both from equity advanced by the Agricultural Development Council for Rizal and commercial loans from rural banks and other financial agencies which are guaranteed by the Province. Capital accumulated by farmer associations and savings of individual farmers should be sufficient to replace the equity which the ADCR initially provided.

4.3. Farm Mechanization

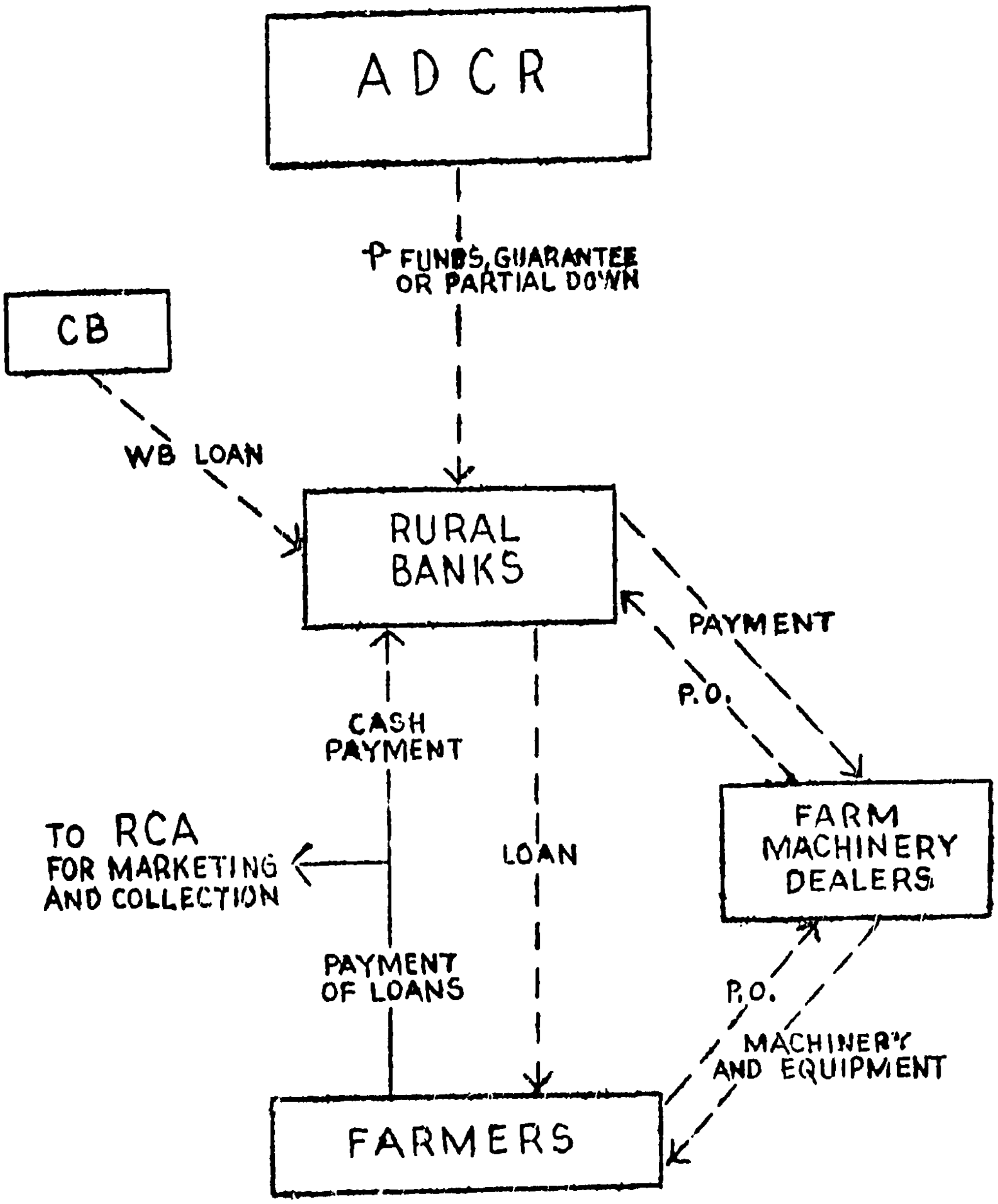
In getting agricultural enhancement moving, land use must be effective and labor utilization must be efficient. Mechanization of farms is essential in decreasing the working hours of the rice farmer which would increase productivity per man-hour spent in the farm.

The most important requirements for full-scale mechanization are irrigation with a complete water control and capital investment in machineries. With full backing from the ADCR, mechanization will surely be affected after which other production requirements will be provided.

Credit assistance willbe available to farmers for the acquisition of hand tractors and other farm equipment. Arrangement with the rural bank has been done to enable farmers to obtain loans equivalent to 90% of the cost aquisition at 8% interest per annum. The rural bank shall shoulder

Figure 9.

FARM MACHINERY
CREDIT PROGRAM



50% while the ADCR shall provide 40%. Farmers' counterpart will only be 10%. Such loan matures within a maximum of 4 years.

4.4. Production Credit

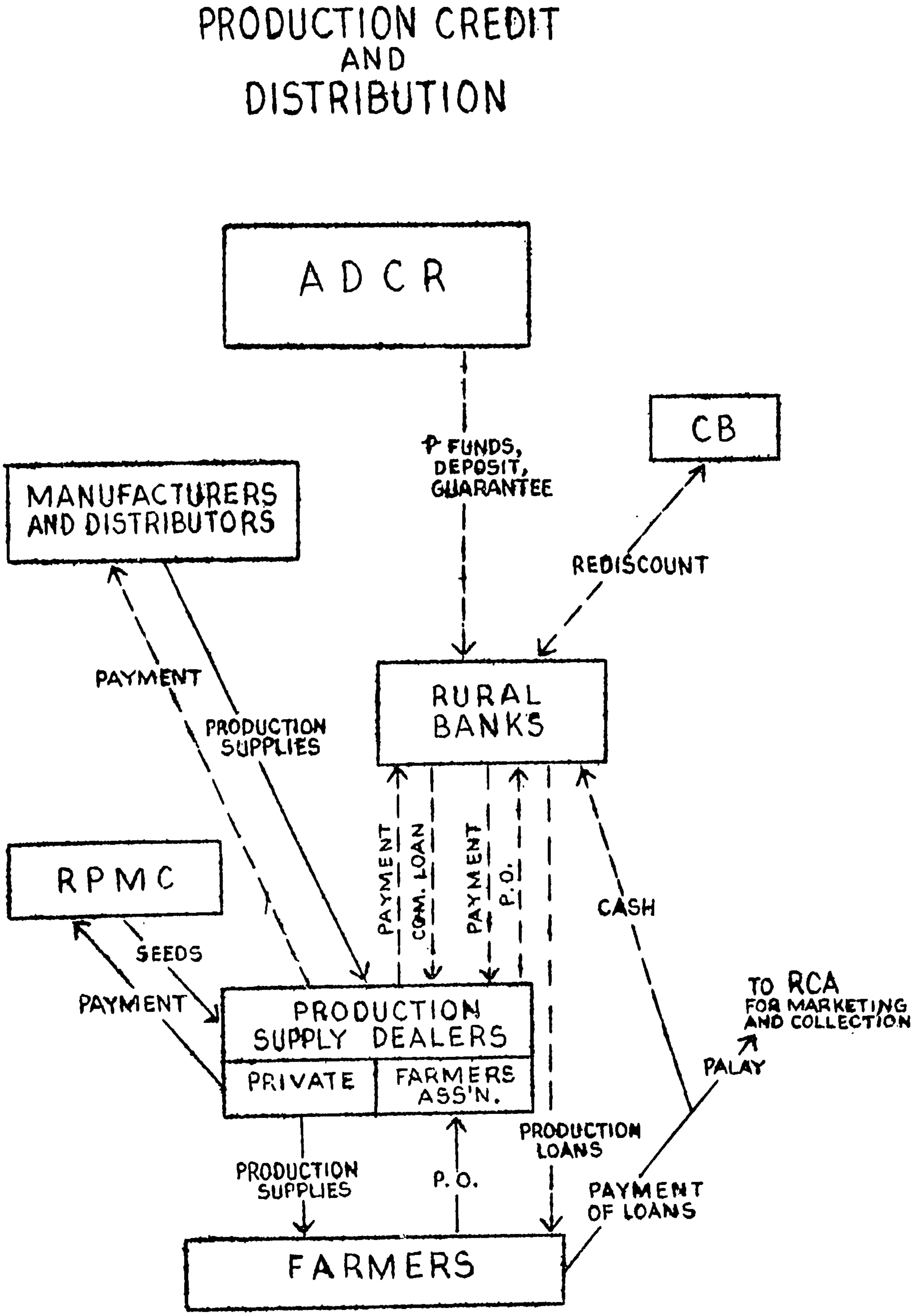
Production credit were initially for rice production but will eventually be extended for the production of vegetables, livestock products and fruits. This will enable farmers to grow new seeds and meet necessary cultural requirements of their crop.

Alien on crops may be accepted as collateral for such loans. Arrangements have been made with the rural banks of the province to provide these services to farmers. Under the agrrement, loans shall be provided only on the basis of farm **plans** and budgets prepared by the ADCR for specific crops and varieties. The ADCR shall provide funds equivalent to and 3% of the total volume of production needed and shall guarantee 70% of all loans approved by the rural bank.

The rural bank may rediscount notes in order to expand the initial amount of funds provided by the ADCR to an amount approximately equivalent to three times.

The loans shall be released only in the form of Purchase Orders which should be presented to authorized farm supply dealers for the delivery of farm supplies.

Figure 10.


PRODUCTION CREDIT AND DISTRIBUTION
ADCR
₱ FUNDS, DEPOSIT, GUARANTEE
CB
REDISCOUNT
MANUFACTURERS AND DISTRIBUTORS
PAYMENT
PRODUCTION SUPPLIES
RURAL BANKS
PAYMENT
COM. LOAN
PAYMENT
P.O.
CASH
RPMC
SEEDS
PAYMENT
PRODUCTION SUPPLY DEALERS
PRIVATE
FARMERS ASS'N.
TO RCA FOR MARKETING AND COLLECTION
PALAY
PRODUCTION LOANS
PRODUCTION SUPPLIES
P.O.
PAYMENT OF LOANS
FARMERS

4.5. Availability of Production Inputs

The establishment of farm supply dealers shall be encouraged in each municipality by providing three forms of incentives.

a) Commercial loans from the rural bank of which 50% of the financial requirements shall be provided by the ADCR;

b) Exclusive distributorship for production loans granted by the rural banks under the joint agreement on production loans;

c) Estimates of the approximate volume of farm supplies and equipment be handled.

Existing supply dealers, prospective investors and farmer associations are enjoined to apply for official dealership. Farmers associations which have accumulated some funds from collection on irrigation may utilize such savings or investments in the production supply distribution business.

Production supply dealers shall accept Purchase Orders presented by farmers and shall deliver the supplies indicated in the purchase orders. These purchase orders shall be encashed in the rural banks upon presentation by dealers.

4.6. Repayment of Loans

All loans provided by the rural banks to farmers shall be strictly supervised by the field supervisor of the ADCR. Field supervisors all recommend production loans and shall be immediately notified of the approval. The marketing system shall be utilized as a collection agent.

The Rice and Corn Administration shall be responsible for providing price support for rice and corn with the institution of the quedan system of buying. Under this set up, the Rice and Corn Administration can trust disbursements of funds to the rural banking system for the payment of palay produced by farmers. Farmers or farmer associations deliver their produce to RCA authorized warehouses which accept the palay deposits and in turn issues quedans or negotiable warehouse receipts and at this point, encumbrances of depositors to the rural bank or the Council shall be indicated. Upon presentation of the quedan to the rural bank, the rural bank effects collection of loans for the Council or for other rural banks where farmers have applications.

In the event, the volume of seed produced can not be handled by the Rizal Producers' Marketing Cooperative, Inc., the Rice and Corn Administration shall accept seeds as deposits and will make premium payments to depositors upon testing and certification of the seeds delivered.

4.7. Technical Assistance

Provisions for supporting services such as production, production credit, supply distribution, farm mechanization and marketing provided, technological change can be speedily achieved from technical assistance to be provided by the Agricultural Development Council for Rizal.

Technical information in the form of periodic brochure, announcements, press releases and radio information, technical guidance through the proper dispersal of training field personnel in various municipalities of the province, demonstrations which will also serve as seed multiplication plots and fertilizer trials to ascertain the type of fertilizer best adopted to soil series found in the province will be provided to enable farmers increase their production and income through improvement in cultural practices.

A training center will be established for the purpose of improving the competence of government personnel, training local government officials in the proper planning and administration of specific projects, training cooperative officials and employees in the proper information of cooperatives, training of farmers in improved technique and cooperative principles and practices.

An experiment station will be established for the purpose of testing new varieties of rice, vegetables and other crops to determine which are most adoptable to the province.

Also new experiment station will serve as nursery to provide an adequate supply of planting materials for semi-permanent and permanent crops.

An animal breeding center will be established to provide natural breeding and artificial insemmination services to livestock producers and to provide other services necessary for the development of a livestock industry in the province.

To support the seed production activities of the Rizal Producers Marketing Cooperative, Inc., a seed testing laboratory will also be established.

The training center, experiment station, breeding station and seed laboratory will be located in one place to be known as the Rizal Agricultural Center. Another assistance which will be provided to farmers are regulatory services such as rat control, prevention or outbreak of worm infestation and immunization of livestock.

All the above services shall be undertaken with the manpower and resources of existing national government agencies located in the province which comprises a total number of technical manpower of 175 people.

4.8. Processing and Marketing of Agricultural Products

The processing and marketing of seeds is only a minor function of the Rizal Producers MArketing Cooperative, Inc. Its major activities will be the marketing of vegetbales, fruits and livestock products. With an investment of about ₱2 million, the Rizal Producers Marketing Cooperative, Inc.

Figure 11.

PALAY MARKETING AND/OR COLLECTION

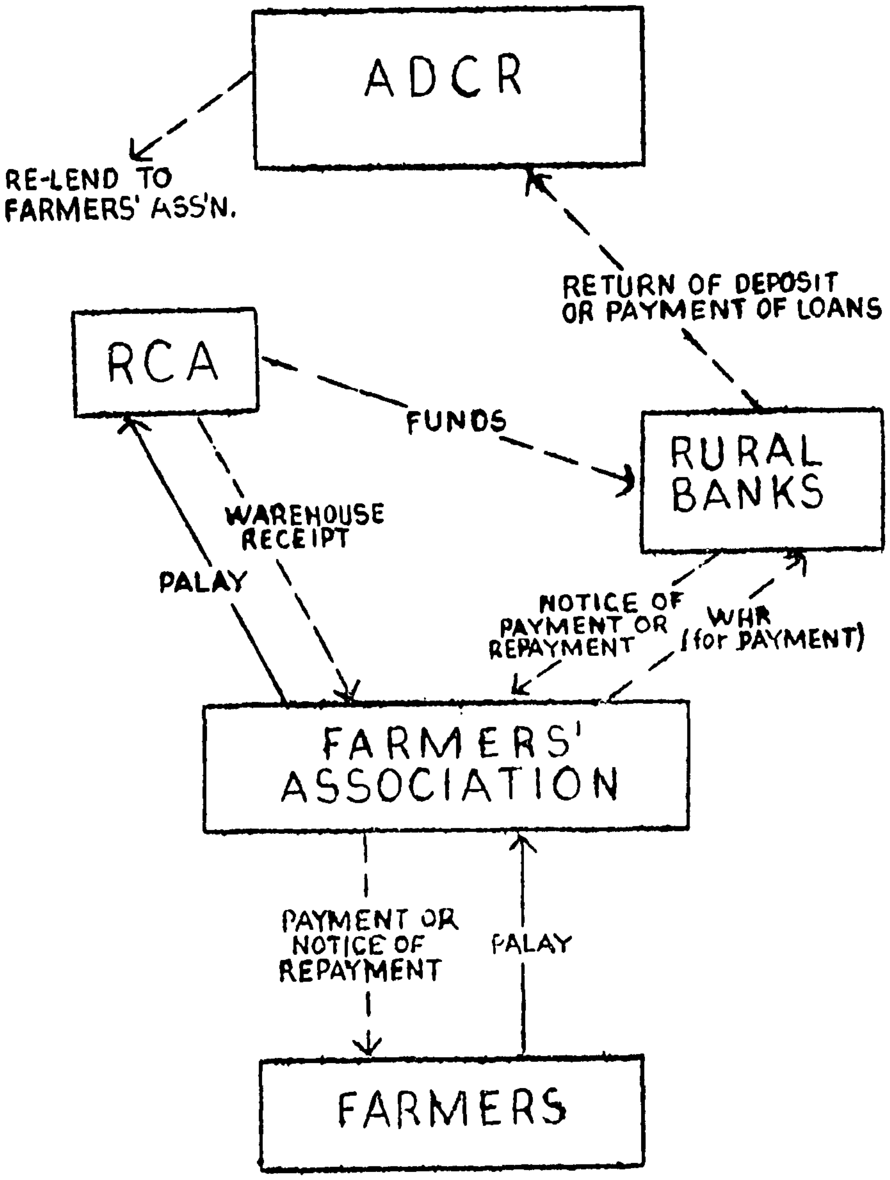
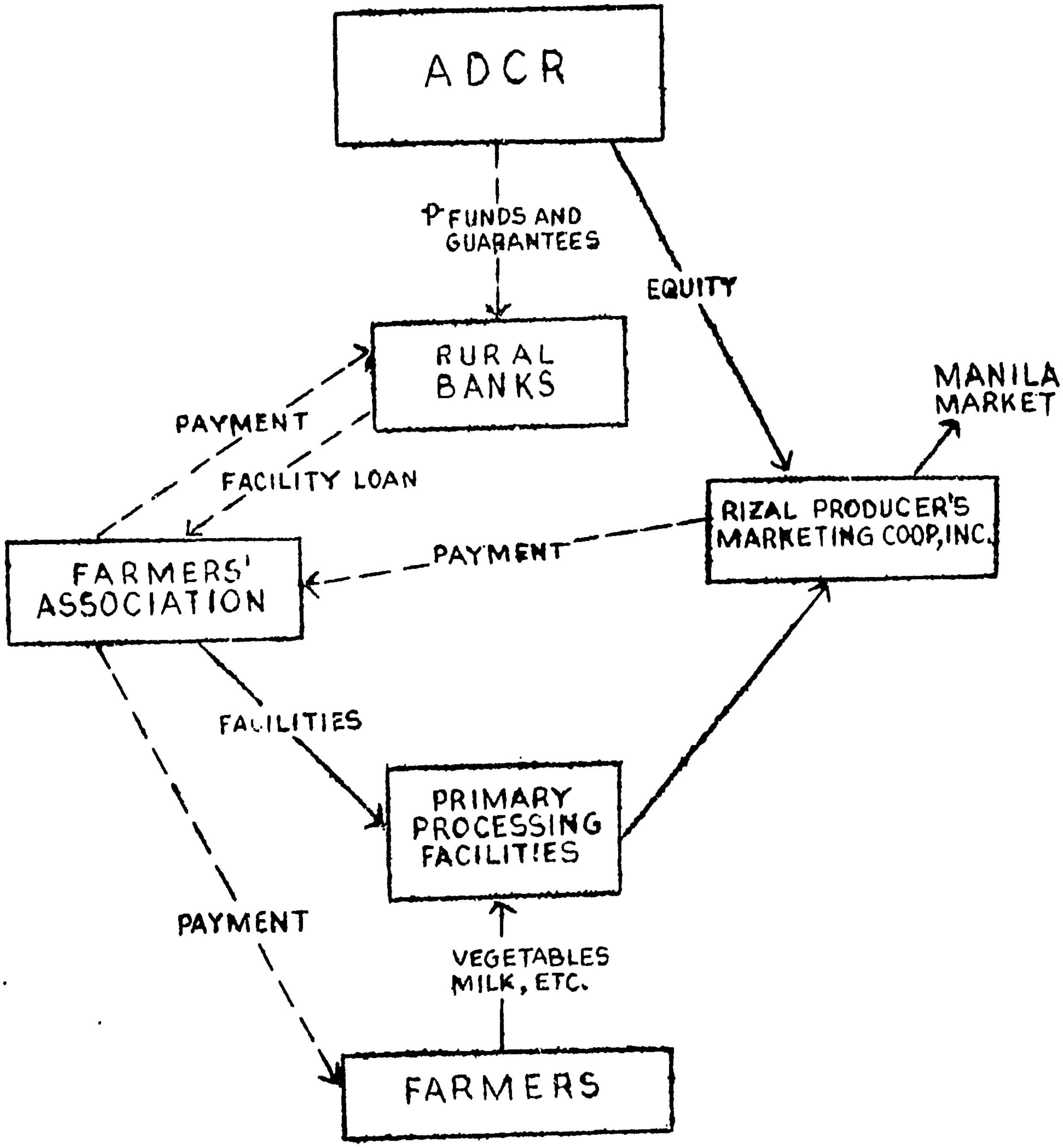

ADCR
RE-LEND TO FARMERS' ASS'N.
RETURN OF DEPOSIT OR PAYMENT OF LOANS
RCA
FUNDS
RURAL BANKS
WAREHOUSE RECEIPT
PALAY
NOTICE OF PAYMENT OR REPAYMENT
WHR (for PAYMENT)
FARMERS' ASSOCIATION
PAYMENT OR NOTICE OF REPAYMENT
PALAY
FARMERS

Figure 12.

MARKETING AND PROCESSING



can establish warehousing and refrigerating facilities, a communication center, an option market and subsequent future market depending on the results of a market survey, the Rizal Producers Marketing Cooperative, Inc. may or may not tie in its forced savings activity with the retail function.

The establishment of the Rizal Producers' Marketing Cooperative, Inc. should provide a ready market for the vegetables, fruits and livestock products produce by the farmers of Rizal and adjoining provinces.

To make the operation of the cooperative market more efficient, it is necessary to support its activity with buying centers and primary processing facilities to be undertaken by farmer associations at the municipal and barrio levels. Arrangement have been made with the rural banks for them to finance the acquisition by farmer associations of primary processing facilities.

The Rizal Producers Marketing Cooperative, Inc. can allocate quotas to the farmer associations for the production of specific amount of crops at specified dates. The farmer associations can in turn reallocate such quota to its farmer-member. With credit assistance, irrigation and technical guidance provided, it would be possible for farmers to enter into contract agreements and produce the specific crops. The major outlets of such products is directed towards the Greater Manila market including institutional market.

4.9. Rizal Producers MArketing Cooperative (RPMC)

In May 2, 1967, some fifty-one farmer-members signed the Articles of Incorporation and By-Laws of the Rizal Producers Marketing Cooperative, Inc. On September 28, 1967 the RPMC was registered with the Securities and Exchange Commission and on October 2, 1967, it was affiliated with the Agricultural Credit Administration.

The RPMC markets, sells, processes, grades, packs, transports, handles, and utilizes all agricultural crops of its members or any of the products derived therefrom. It procures farm supplies and equipment needed by its members. With an efficient marketing organization owned and managed by them, they can be assured of higher prices for their produce. By consolidating their needs, they can buy in bulk and thereby decrease cost prices by availing of wholesale and discount arrangement.

The RPMC has a modest authorized capital of ₱100,000.00, divided into 1000 shares of stock of the par value of ₱100.00. Seven hundred fifty (750) are common shares and 250 are preferred shares.

At the time of registration with the Securities and Exchange Commission, the 51 incorporation and subscribed to

₱26,600.00 worth of shares of stock and had paid up ₱5,320.00.

Membership is open to agricultural producers in Rizal and their cooperative associations. They may purchase common shares of stock and have the right to vote. Preferred shares of stock may be purchased by any person, natural or juridicial, but without voting rights.

The management of the RPMC is entrusted to a Board of Directors of seven (7) members who are elected by the members in a general assembly. They serve for a term of two years. The Board elects a Chairman from among its members. It appoints a Manager, a Treasurer and a Secretary but in no case may any member of the Board occupy any of these positions.

On the marketing aspect of the functions, the RPMC has two outlets: local and foreign markets. It is credited with being the first farmer's cooperative in the Philippines to export rice seeds.

Besides marketing the unecumbered produce of its members, the RPMC has been authorized by the ADCR to be the sole marketing agency in the disposal of certified rice seeds produced by farmers given production loans by the ADCR. These farmers given ADCR production loans are invariably members of the RPMC. The rice produce is delivered to an

RPMC warehouse receipts are issued therefor. Said warehouse receipts are endorsed to the RPMC by the farmer depositors for marketing.

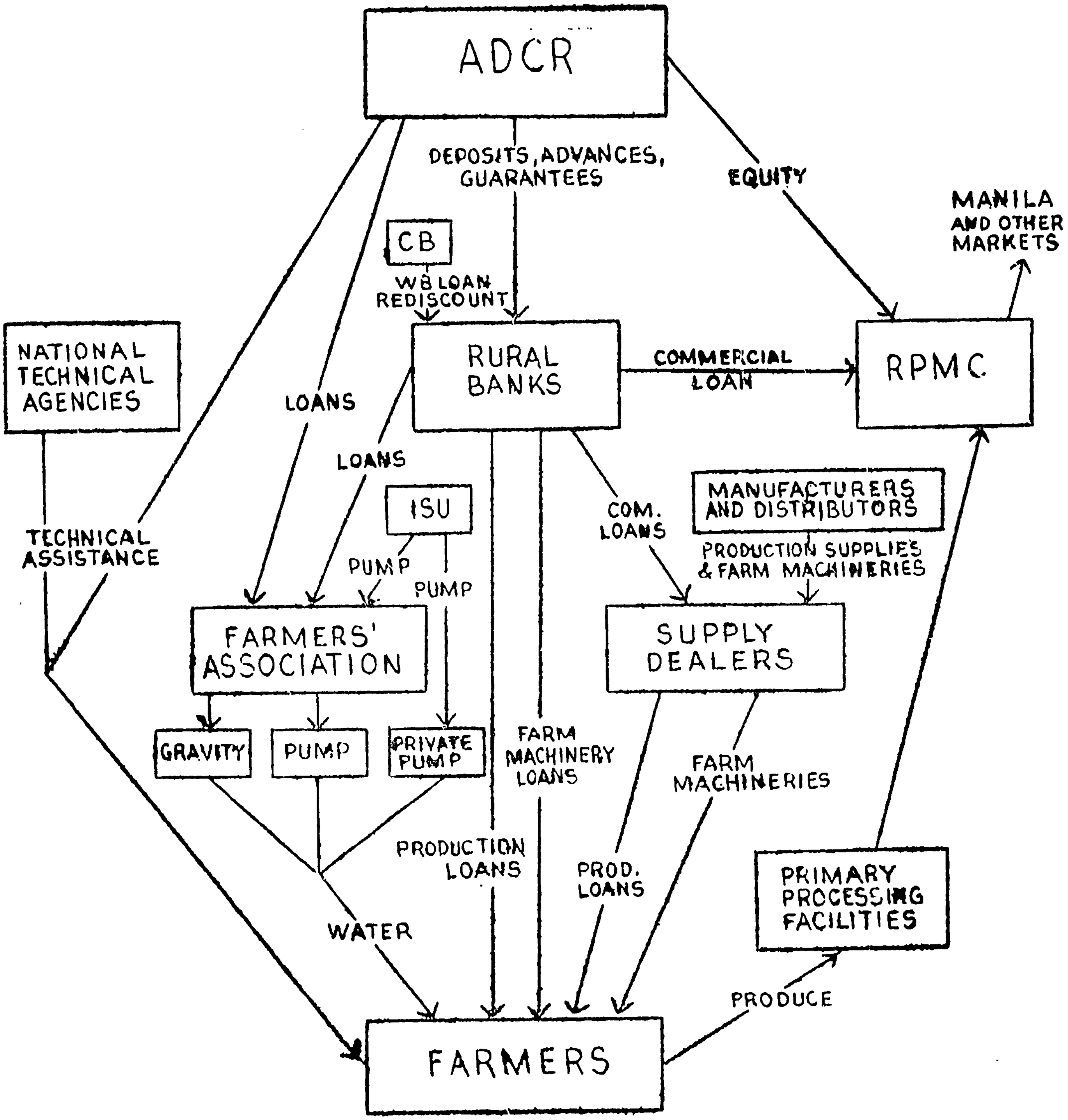
Upon maturity of the loan or on the option of the farmer, whichever is earlier, the RPMC markets the seeds and pays the farmer the value of his seeds after deducting encumbrances and other charges.

While marketing has so far been confined to rice seeds, it is expected that other agricultural produce of its members will momentarily be marketed, such as vegetables and fruits, other cereals, and poultry and livestock products.

On the supply aspects, the RPMC procures farm needs from two sources: local manufacturers and foreign suppliers. The supplies are distributed in the different localities, in the province through authorized farm dealers. Being based in Pasig, RPMC has to reach the farmers through the farm dealer medium. These farm dealers are members of the RPMC and they may either be individuals or farmers cooperatives. In area where cooperatives are not yet organized, farm dealership may be granted to an individual member. However, in the development program, individual dealership will give way to cooperative dealership as fast as farmer cooperatives are organized.

Figure 13.

SUMMARY OF ASSISTANCE TO FARMERS



4.10. IR8 Rice Variety

The nucelus of the rice production program of ADCR was the IR8 variety. This rice strain previously known as IR8-288-3 has become the first variety named by thr International Rice Research Institute.

In the dry season of 1962 a plant breeder at the International Rice Research Institute took pollen from the flowers of a short indica rice variety from Taiwan and placed it on the pistils of emasculated flowers of a tall tropical indica. The short indica was Dee-geowoo-gen, and the tall one Peta. In the Institute's plant breeding records the cross was designated IR8.

Thus begun a process which led, four years later, to a new rice strain that has consistently topped yield trial in several Asian countries, and the seed of which has been distributed to hundreds of farmers in the Philippines and for testing in other countires in the hope that it will help alleviate the current shortage of rice in tropical Asia.

As a result of the initail cross pollination, 130 seeds were formed and these, when grown in pots in the screenhouse, produced a number of firat generation plants. Seeds from several of these were planted in the field to provide a second generation of about 10,000 plants. Those that were tall, late maturing, or otherwise undersirable were removed.

Seeds from the remaining plants were bulked and planted in the blast nursery where highly susceptible seedlings were discarded. From this third generation population of about 10,000 plants, 289 of the best individual plants were selected and the seed from each sown separately in the blast nursery to give 289 pedigree rows of the fourth generation. Again the blast susceptible seedlings were discarded.

From row number 288, a single plant (number 3) was selected and designated IR8-288-3. Seed from this plant was grown as a fifth generation in a single pedigree row and the seed produced was bulked to provide the basic seed stock of IR8-288-3.

A summary of the events leading to the development of IR8-288-3 is given in Figure 13.

In all tropical countries in which it has been tested, IR8 has demonstrated a remarkable high yielding ability. It is short sturdy variety, about 100 cm. (39 inches) high, insensitive to photoperiod, matures in 120 to 130 days, appears to have a wide range of adaptability to conditions encountered in the tropics, and is resistant to the lodging which is responsible for large yield losses in many varieties. Its response in terms of grain yield to nitrogen fertilizer is dramatic and it is responsibly resistant to most common diseases of rice. IR8 has a medium-long grain which cooks

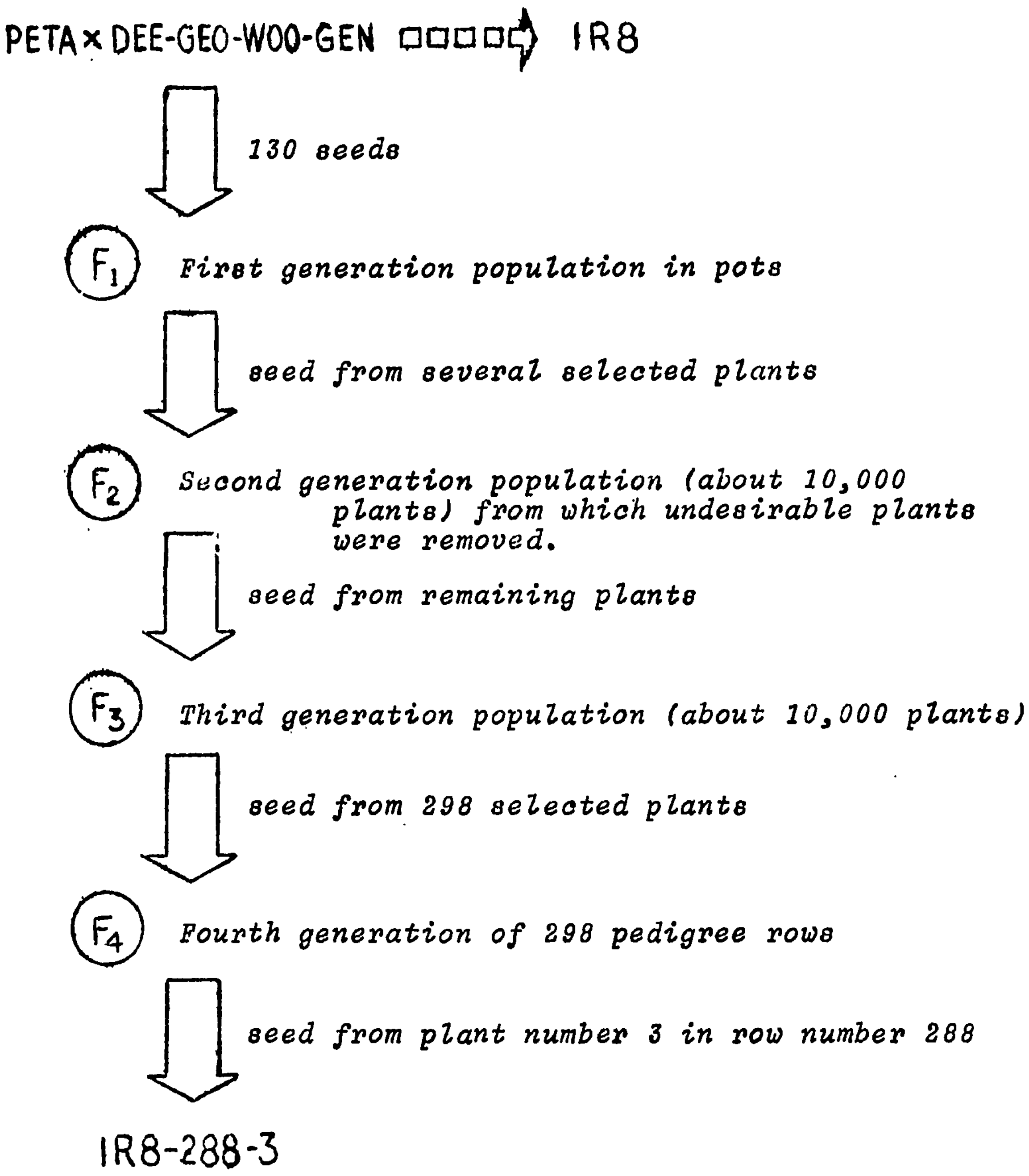

PETA × DEE-GEO-WOO-GEN
IR8
130 seeds
F₁
First generation population in pots
seed from several selected plants
F₂
Second generation population (about 10,000 plants) from which undesirable plants were removed.
seed from remaining plants
F₃
Third generation population (about 10,000 plants)
seed from 298 selected plants
F₄
Fourth generation of 298 pedigree rows
seed from plant number 3 in row number 288
IR8-288-3

Figure 13. Historical Development of IR8-288-3

dry and fluffy and is generally accepted to most Asian consumers.

Over the past year, seeds of the new variety has been requested by and sent to over 60 countries, mainly in the tropics, for testing and multiplication and considerable areas have been planted commercially in the Philippines. The Institute has a further limited quantity of seed for distribution to countries outside the Philippines. However, in this connection, ADCR is proud to say that it is playing a major role in the marketing and distribution of IR8 seeds locally and abroad. (See also Section 4.8)

The size of the task ahead of increasing rice productivity calls for the use of high yielding variety like IR8. This variety in order to prove its yielding potential will require adequate water supply and production inputs like fertilizer and chemicals, improved cultural practices and other measures including the protection of the crop against pests and diseases and improved tools and mechanization which can add materially through better cultural practices.

4.11. Initial Rice Project (1966 Wet Season)

Sometime in June, 1966 the ADCR had thought of immediately adopting the recent findings on rice technology in Rizal by conducting a province-wide seed production

Table 27. NUMBER OF FARMS, AREA PLANTED IN HECTARES, PRODUCTION IN CAVANS AND PRODUCTIVITY, BY CHEMICAL USE . RIZAL, 1966.

Chemical Used	Number of Farms (#)	Number of Farms (%)	Area Planted (ha)	Area Planted (%)	Production (cav)	Production (%)	Productivity (cavan/hec.)
None	7,137	84	8,318.0	80	456,304.6	78	77 .2
All Chemical	1,343	16	2,048.0	20	128,230.4	22	63
Resitox	165	(12)	243.2	(12)	14,651.3	(11)	60
2,4-D	498	(37)	781.0	(38)	44,821.4	(35)	57
Endrin	412	(31)	634.0	(31)	42,554.4	(33)	67
Follidol	148	(11)	212.5	(10)	15,241.5	(12)	72
Malathion	35	(3)	58.2	(3)	2,756.7	(2)	47
Sevin	33	(3)	62.1	(3)	4,763.1	(4)	77
DDT	19	(1)	24.5	(1)	981.6	(1)	40
Others	33	(3)	39.9	(2)	2,360.6	(2)	74
RIZAL	8,480	100	10,366.0	100	584.535	100	56

PLEASE RETURN TO

Raminad ranks first followed by Wagwag, BE-3, Tjahaja, Mactan and others. Because varieties planted in the province were considerably high yielding, the average productivity was already very high as compared to other provinces. Note the comparison as shown in Section 5.1.10.

5.1.7. Chemical Use

Before the implementation of ADCR's rice program, only 1,343 or 16 percent of the farmers in Rizal were using chemicals. Some of the chemicals most commonly used were 2,4-D (a herbicide), Endrin, Resitox, Follidol and others. On the contrary, however, results indicated that farms with no chemicals applied yielded higher than farms using chemicals only when their crop was already attacked by pests and diseases whereby chemicals would have little or no effect at all. This is different from the modern concept of using chemicals as a preventive measure rather than a control measure.

not include fertilizer

5.1.8. Fertilizer Use

Out of 8,480 farmers, only 4,687 or 55 percent were not using fertilizers and 3,793 or 45 percent were using fertilizers. The fertilizers most commonly used by the farmers were complete fertilizer which ranks first, followed by ammonium sulfate, urea, guano, ammonium phosphate, organic manure and others.

X

Table 26. NUMBER OF FARMS, AREA PLANTED IN HECTARES, PRODUCTION IN CAVANS AND PRODUCTIVITY, BY KIND OF VARIETY USED. RIZAL. 1966.

Variety Used	Number of Farms (#)	(%)	Area Planted (ha)	(%)	Production (Cav)	(%)	Productivity (cavans/hec)
Intan	3,105	37	4,258.5	41	230,680.7	40	54
Macan	1,292	15	1,547.7	15	94,547.9	16	61
Thailand	748	9	516.6	5	24,623.4	4	48
Raminad	587	7	770.3	7	56,639.3	3	74
BPI - 76	346	4	464.7	4	24,471.9	4	53
BE - 3	311	4	544.5	5	37,786.6	6	69
Wagwag	145	2	207.6	2	14,607.5	2	70
Tjeremas	49	1	151.2	1	7,104.2	1	47
Tjahaja	82	1	114.6	1	7,757.2	1	68
Others	1,815	21	1,790.3	19	86,316.3	17	48
RIZAL	8,480	100	10,366.0	99*	584,535.0	97*	56

*Percentage may not add up to 100 because of rounding error.

program. The Council had only three days to receive applications of interested farmers and at the same time to inspect the farms. Some difficulty arose since farmers had already started sowing seeds and others have planted their old varieties. The selection of farms were based on the following criteria: (a) nearness to roads, (b) availability of irrigation water, (c) willingness of a farmer to adopt innovations, and (d) reputation of a farmer in the locality. ADCR was able to select 47 seed cooperators scattered in 18 municipalities of the province. The list of farmer, by municipality can be seen in Table 19. Among the farms selected, still a number of them are rainfed farms.

A contract of agreement between the farmer and the provincial government of Rizal was signed. The farmers agreed to follow all the management and cultural practices to be adopted as specified in the farm, to sell all his produce to the province at ₱25.00 per cavan of 48 kilograms fresh weight. All technical and financial assistance were provided by the ADCR and the province guaranteed his produce will not be lower than 80 cavans per hectare.

The province was fortunate in acquiring 2 tons (about 45 cavans) of IR8 rice seeds from the International Rice Research Institute. IR8 rice variety was chosen to be the nucleus of the rice program because its high yielding

Table 19. NITROGEN, PHOSPHORUS AND POTASIUM FERTILIZER APPLICATION IN KILOGRAMS PER HECTARE REGULAR SEASON, 1966.

Municipality		Name of Farmer		N	P	K
A.	Antipolo	1.	Ceperiano Bleza	74	44	22
		2.	Apolonio Gatlabayan	128	0	0
		3.	Julio Gatlabayan	102	30	40
		4.	Candido Leyva	100	0	0
B.	Baras	5.	Leon Geronimo	123	60	0
		6.	Aniano Tesoro	131	0	0
C.	Binangonan	7.	Apolinar Anore	141	29	14
		8.	Nicasio Bucalan	94	17	0
D.	Cainta	9.	Alipio de Leon	111	68	34
E.	Jalajala	10.	Tomas Balajadia	76	18	18
F.	Las Pinas	11.	Zosimo Aranda	79	18	0
G.	Marikina	12.	Eliseo de Guzman	190	83	41
		13.	Melencio Silvestre	77	22	11
H.	Montalban	14.	Julian Manahan	125	37	37
		15.	Felipe Santos	77	20	20
I.	Morong	16.	Quirino Balajadia	95	0	0
		17.	Conrado Buenaventura	42	42	42
		18.	Simplicio Castillo	95	50	0
		19.	Julio Inguito	102	0	0
		20.	Petronilo Fernando	110	0	0
		21.	Maximo Javier	142	47	47
		22.	Guido de Jesus	185	0	0
		23.	Morong High School	97	64	64
J.	Muntinglupa	24.	Pedro Aman	151	40	0
		25.	Marcelino Arandia	120	40	0
		26.	Rogelio Unira	78	32	0
		27.	Antonio Velasco	133	44	0
K.	Pasig	28.	Delfin Bukalan	79	21	21
		29.	Domiciano Cruz	84	0	0
		30.	Pablo Jimenez	50	16	0

Table 19 continued . . .

L.	Pililla	31.	Gregorio Alejan	131	33	33
		32.	Jose de Leon	126	0	0
		33.	Manuel Lucudan	101	40	0
M.	San Mateo	34.	Jose Adone	168	48	48
		35.	Aurelio Manahan	129	0	0
		36.	Pedro Valerio	97	0	0
N.	Taguig	37.	Marcelo Capistrano	126	28	28
		38.	Felix Santos	125	28	28
		39.	Benedicto Valencia	112	45	22
O.	Tanay	40.	Leoncio Amonoy	122	25	25
		41.	Serafin Benavidez	93	0	0
		42.	Dominador Capistrano	76	21	21
		43.	Santos Catolos	79	31	15
		44.	Manuel Tanjuatco	102	34	34
P.	Taytay	45.	Aquilino dela Cruz	100	27	0
		46	Gregorio Vallestero.	92	30	0
Q.	Teresa	47.	Gregorio de Leon	137	58	58
		48.	Ponciano de Leon	81	42	42
	Average			107	28	15

potential (more than 200 cavans per hectare) can only be produced if given the appropriate inputs and innovation.

Implemented after the selection/of seed producers, the ADCR undertook the collection of soil samples for analysis. Fertilizer recommendations were based on these soil analyses which ranges from 50 to as high as 200 kilograms of nitrogen per hectare. All the farmers have basal application of fertilizer and others have topdressing 40 days after transplanting. On the average, 107 kilograms Nitrogen, 28 kilograms Phosphorus and 15 kilograms Potasium per hectare was the rate of fertilizer application. The summary of fertilizer recommendation of ADCR is shown in Table 18. Based in IRRI findings, GAMMA-BHC were applied twice, 1.8 kg/ha. at 10days after transplanting and 3.0 kg/ha applied uniformly in all farms. Other chemicals like Sevin 85 was applied at the rate of 2 kg/ha. In some cases, other insecticides were applied if rice pest cannot be fully controlled.

One distinct feature in the implementation of the rice program in Rizal is the farm plan budget. The farm plan is a schedule of day to day activities of the farmer planting IR8. ADCR was bold enough to prepare such activities of the farmer. A farm plan contains the specific date of farm operations; from land preparation, sowing of seeds up to the harvesting of the crop. The amount of fertilizers and chemicals and their specific dates of application is also contained in the farm plan. This scheme is another breakthrough in the management of rice farms.

Based on the farm plan, a farm budget was also prepared. The materials and supplies used in the farm plan were translated to monetary values wherein the approximate cost were given. A farm plan and a budget was prepared by the Technical Group for each of the 47 seed cooperators. The farm plan and budget was used in obtaining loans from the rural banks as originally conceived.

Because of limited time, ADCR took responsibility of obtaining loans from rural banks. ADCR also made the procurement of supplies, materials and equipment for the seed cooperators. However, at this stage, ADCR was negotiating a working agreement with the Federation of Rural Banks in Rizal regarding ADCR's credit assistance program. This agreement with Central Bank's Department of Rural Banks later became the basis of their agricultural credit program now better known as Agricultural Guarantee Loan Fund (AGLF).

At the start of this project, ADCR's technical group began a training program on rice culture and management of the new IR8 variety. These involved in the program were the Farm Management Technicians (FMT) of the APC and BPI personnel assigned in the province. Thus, actual supervision of seed cooperators became part of their on-the-job training and extension work. These personnel were responsible in the follow-up and guidance of farm activities of a seed cooperator using the farm plan as a base.

The harvesting operations started in November 1966 up to later part of January 1967. Some farms were damaged by floods because of passing typhoons while others experienced drought. Inspite of these calamities, the program produced commendable results. The results are given in Table 20.

On incentive provided by ADCR was the conduct of a Seed Production Contest among cooperators. The farms were divided into two categories: Farms having an area of 0.75 hectare and above, and the other below 0.75 hectare. Two major prizes were at stake, a Kubota power tiller for the first category and a 3 inch Yanmar irrigation pump for the second category. The highest production in Category I was a record of 226.58 cavans per hectare and 138.06 cavans per hectare in Category II.

4.12. Procedures Followed in the Rice Program

From the experience in the initial project, the procedures below were followed by the ADCR in the implementation of the rice program.

a. A farmer must go to the nearest farm supply dealer and make reservation of rice seeds for planting.

Table 20. AREA IN HECTARES, PRODUCTION IN CAVANS OF 44 KILOGRAMS (AT 14 PERCENT MOISTURE CONTENT), PRODUCTIVITY PER HECTARE OF SEED COOPERATORS, BY MUNICIPALITY. REGULAR (WET) SEASON. FEBRUARY 1966.

Municipality	Name of Farmer	Area (ha)	Production (cavans)	Productivity (cav/ha)
A. Antipolo	1. Ceperiano Bleza	0.544	63.72	117.13
	2. Apolonio Gatlabayan	0.702	89.68	127.75
	3. Julio Gatlabayan	0.941	108.74	115.56
	4. Candido Leyva	0.900	124.06	137.84
B. Baras	5. Leon Geronimo	0.833	97.29	116.80
	6. Aniano Tesoro	0.850	92.27	108.56
C. Binangonan	7. Apolinar Anore	0.835	112.00	134.13
	8. Nicasio Bucayon	1.188	161.62	136.62
D. Cainta	9. Alipio de Leon	0.885	88.55	100.06
E. Jalajala	10. Tomas Balajadia	1.169	97.21	83.16
F. Las Pinas	11. Zosimo Aranda	1.655	116.75	70.55
G. Marikina	12. Eliseo de Guzman	0.580	79.13	136.43
	13. Melencio Silvestre	1.618	113.25	69.99
H. Montalban	14. Julian Manahan	1.522	344.86	226.58
	15. Felipe Santos	1.061	121.06	114.41
I. Morong	16. Quirino Balajadia	0.472	65.16	138.06
	17. Conrado Buenaventura	0.337	38.12	113.10
	18. Simplicio Castillo	0.402	42.50	105.73
	19. Julio Inguito	0.441	56.36	127.81
	20. Petronilo Fernando	0.820	76.35	93.11
	21. MAximo Javier	0.451	56.27	124.76
	22. Guido de Jesus	0.292	35.22	120.63
	23. Morong High School	0.660	63.54	96.28
J. Muntinglupa	24. Pedro Aman	0.747	94.01	125.85
	25. Marcelino Arandia	1.003	131.42	131.02
	26. Rogelio Unira	1.557	189.09	121.44
	27. Antonio Velasco	0.452	61.17	135.32

Table 20 continued . . .

K.	*Pasig*	*28. Delfin Bukalan*	*1.655*	*170.98*	*103.31*
		29. Domiciano Cruz	*1.140*	*115.99*	*101.75*
		30. PAblo Jimenez	*1.831*	*104.40*	*57.02*
L.	*Pililla*	*31. Gregorio Alejan*	*0.850*	*96.61*	*105.43*
		32. Jose de Leon	*1.012*	*89.40*	*88.34*
		33. Manuel Licudan	*0.991*	*67.09*	*67.70*
M.	*San Mateo*	*34. Jose Adona*	*0.872*	*102.01*	*116.98*
		35. Aurelio Manahan	*1.084*	*183.47*	*169.25*
		36. Pedro Valerio	*0.662*	*90.83*	*137.20*
N.	*Taguig*	*37. Marcelo Capistrano*	*0.949*	*117.62*	*123.95*
		38. Felix Santos	*0.990*	*110.30*	*111.41*
		39. Benedicto Valencia	*1.073*	*116.30*	*108.39*
O.	*Tanay*	*40. Leoncio Amonoy*	*1.100*	*128.26*	*116.39*
		41. Serafin Benavidez	*1.029*	*145.94*	*141.83*
		42. Dominador Capistrano	*1.326*	*157.52*	*118.79*
		43. Santos Catolos	*1.524*	*158.71*	*104.14*
		44. Manuel Tanjuatco	*1.224*	*177.30*	*144.85*
P.	*Taytay*	*45. Aquilino de la Cruz*	*1.125*	*74.72*	*66.42*
		46. Gregorio Vallestero	*1.003*	*129.40*	*126.49*
Q.	*Teresa*	*47. Gregorio de Leon*	*0.342*	*44.37*	*129.73*
		48. Ponciano de Leon	*0.469*	*45.01*	*95.98*
		Rizal	*45.168*	*5138.64*	*117.00*

Note: The above farms are ncluded in the Seed Production Contest. Area and production of farms planted to IR8 not included in the Contest is not given in the above Table.

Recommended seeds at present are Rizal Seed No. I (IR8), Rizal Seed No.2 (C4-63) and Rizal Seed No. 3 (IR5). For this coming planting season, IR8-68, the official line IR8, and C4-113 will soon be mass produced in the province. ADCR provides financial assistance only to farmers planting the above-mentioned high yielding varieties.

b. Consult the FMT or any field technician of ADCR and other agricultural agencies in the province to learn more of the requirements of modern rice farming.

A soil sample of the farm has to be taken by the farmer and the FMT will take the responsibility of having the soil analyzed with a fee of ₱2.00.

c. After knowing the results of soil anlysis, Production Forms 7a and 7b have to be filled up. The former contains the daily activities that a farmer should do in the care and management of the rice crop or known as "farm plan" while the latter or farm budget contains the translated cash requirements of the supplies and materials used in the farm plan. These two forms shall be brought to the Rural Bank if the farmer needs credit assistance.

In some cases, a farmer finances the production of his farm by himself. Or, after filling up the two forms, a farmer may use other source of credit other than the rural bank.

d. The Rural Bank, in turn will issue Purchase Orders are negotiable receipts similar to travellers check and money order or which contains the individual orders for the supply and materials required in the farm budget.

e. Because orders for supplies and materials are placed on individual Purchase Orders, a farmer can have the option of looking for a farm supply dealer offering the best price. Purchase Orders, if presented to authorized farm supply dealers will issue supply or materials needed by the farmer. Authorized supply dealers encash the Purchase Orders to the addressed Rural Bank.

By this method, the farmer does not have the chance of getting hold of the money. This prevents him from using the money for other purposes which in the past, cash obtained through production credit do reach the farm but used elsewhere.

f. During the entire cropping period, the farmer must always consult with the field technician in order to learn the sophisticated methods of modern rice technology.

g. If the intention of the farmer is to produce seeds, he must ask a seed **inspector of the BPI thru** the field technician to have his field certified for seed production. Certification includes both field and laboratory analyses. The aim of the province is to provide a source of seed materials of rice.

h. Marketing of rice produced by farmers of Rizal is being assisted by the Rizal Producers Marketing Cooperatives, Inc.

i. After payment is received from the produced, a farmer must have to pay his obligation with the bank. Commodity loan in case of low price of palay in market to pay off production loan in the bank.

j. The excess requirements of the household has to be saved in banks. The importance of budgeting and savings are being emphasized by lady technicians of the APC.

V. IMPACT AND IMPLICATION

5.1. Rice Situation in May 1966

5.1.1. Area, Production and Productivity

Before the full implementation of the ADCR program which was started in late June, 1966, the number of farms in Rizal* was 8,480. These farms had an area of 10,366 hectares with the total production of 584,535 cavans. At this time, the productivity in cavans per hectare was 56 which was already high as compared to other provinces. The biggest area of rice farms can be found in Morong with an area of 3,411 hectares or almost 30 per cent of the total area planted in the province. Also recorded was Las Pinas with an area of 1,078 hectares, but then most of these farms had no irrigation and thus being used for other purposes. These farms were either being developed into subdivision lots or industrial sites and others were being kept idle for land speculation. Some area, therefore, would represent cultivated area by farmers who rent or squat the land while waiting for full industrial or residential development of the area. The other municipality which had a big rice area area are Tagig, Tanay, Muntinglupa and Binangonan where the total hectarage planted to rice was above 500 hectares.

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*Throughout the discussion of this chapter, Rizal will be referred to 20 agricultural municipalities of the province as also discussed in Chapter II.

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Table 21. PALAY TOTAL: ESTIMATES OF FARMS REPORTING, AREA PLANTED IN HECTARES, PRODUCTION IN CAVANS AND PRODUCTIVITY IN CAVANS PER HECTARE. RIZAL. MAY 1966.

	Municipality	Farms Reporting	Area (ha.)	Production (cavans)	Productivity (cavan/hec.)
1.	Angono	101	122.8	9,649.6	78.6
2.	Baras	122	101.2	4,494.5	48.9
3.	Binangonan	523	512.7	27,918.2	50.5
4.	Cainta	214	284.2	23,939.0	84.2
5.	Cardona	74	32.7	2,521.8	76.8
6.	Jalajala	304	476.1	14,696.0	30.8
7.	Montalban	310	366.6	30,148.3	82.2
8.	Morong	2,299	2,411.0	117,414.0	48.6
9.	Pililla	463	437.7	21,735.0	49.6
10.	San Mateo	404	489.6	22,838.9	67.0
11.	Taguig	544	818.1	51,793.9	63.3
12.	Tanay	715	730.5	28,520.1	39.0
13.	Taytay	61	94.3	8,171.2	86.5
14.	Teresa	375	388.6	21,839.5	56.2
15.	Antipolo	500	457.9	32,809.6	71.65
16.	Las Pinas	545	1,078.0	61,969.1	57.53
17.	Marikina	209	326.8	22,364.5	34.22
18.	Muntinglupa	405	601.7	23,077.0	38.35
19.	Pasig	276	597.2	45,655.2	76.45
20.	Pateros	31	38.3	2,524.5	65.74
	RIZAL	8,480	10,366.0	584,535.0	56.2

Table 21a. PALAY FIRST CROP: ESTIMATES OF FARMS REPORTING, AREA PLANTED IN HECTARES, PRODUCTION IN CAVANS AND PRODUCTIVITY IN CAVANS PER HECTARE. RIZAL. MAY 1966.

	Municipality	Farm Reporting	Area (ha)	Production (cavans)	Productivity (cavan/hec.)
1.	Angono	81	110.6	8,868.9	80.2
2.	Baras	61	59.4	3,304.0	55.6
3.	Binangonan	413	435.2	23,460.1	53.9
4.	Cainta	214	284.2	23,939.0	84.2
5.	Cardona	66	29.1	2,199.6	75.6
6.	Jalajala	144	198.9	9,013.2	45.3
7.	Montalban	298	357.5	29,978.0	83.8
8.	Morong	1,750	1,978.0	95,848.1	48.4
9.	Pililla	365	384.4	20,196.4	52.5
10.	San Mateo	402	480.6	32,589.3	67.8
11.	Taguig	540	801.3	50,547.0	63.0
12.	Tanay	152	159.8	8,815.8	55.2
13.	Taytay	61	94.3	8,171.2	86.6
14.	Teresa	375	388.6	21,839.5	56.2
15.	Antipolo	416	427.2	31,321.1	73.3
16.	Las Pinas	539	1,059.6	61,284.6	57.8
17.	Marikina	197	322.7	22,246.3	68.9
18.	Muntinglupa	391	570.9	21,420.8	37.5
19.	Pasig	276	597.2	45,655.2	76.4
20.	Pateros	31	38.2	2,524.5	65.9
	RIZAL	6,772	8,777.8	523,222.5	59.6

Table 21b. PALAY, SECOND CROP: ESTIMATES OF FARMS REPORTING, AREA PLANTED IN HECTARES, PRODUCTION IN CAVANS AND PRODUCTIVITY IN CAVANS PER HECTARE. RIZAL. MAY 1966.

	Municipality	Farm Reporting	Area (ha)	Production (cavans)	Productivity (cavan/hec.)
1.	Angono	18	8.2	719.3	87.7
2.	Baras	57	40.0	1,597.7	39.9
3.	Binangonan	100	71.8	4,112.4	57.2
4.	Cainta				
5.	Cardona	8	3.6	322.2	89.5
6.	Jalajala	4	1.7	131.6	77.4
7.	Montalban				
8.	Mrong	400	287.7	12,382.7	43.0
9.	Pililla	79	41.3	1,304.1	31.5
10.	San Mateo				
11.	Taguig	4	16.8	1,246.9	74.2
12.	Tanay	115	113.1	6,312.8	55.7
13.	Taytay				
14.	Teresa				
15.	Antipolo				
16.	Las Pinas	6	18.4	684.5	37.2
17.	Marikina				
18.	Muntinglupa	14	30.8	1,656.2	53.7
19.	Pasig				
20.	Pateros				
	RIZAL	805	633.4	30,470.4	48.1

Table 21c. PALAY UPLAND: ESTIMATES OF FARMS REPORTING AREA PLANTED IN HECTARES, PRODUCTION IN CAVANS AND PRODUCTIVITY IN CAVANS PER HECTARE. RIZAL. MAY 1966.

	Municipality	Farm Reporting	Area (ha)	Production (cavans)	Productivity (Cavan/hec.)
1.	Angono	2	4.0	61.40	15.2
2.	Baras	4	1.8	47.8	26.6
3.	Binangonan	10	5.7	345.7	60.6
4.	Cainta				
5.	Cardona				
6.	Jalajala	156	275.5	5,551.2	20.1
7.	Montalban	12	9.1	170.3	18.7
8.	Morong	149	145.3	9,183.2	63.2
9.	Pililla	24	12.0	234.5	19.5
10.	San Mateo	2	9.0	249.6	27.7
11.	Taguig				
12.	Tanay	448	457.6	13,391.5	29.2
13.	Taytay				
14.	Teresa				
15.	Antipolo	84	30.7	1,488.5	48.4
16.	Las Pinas				
17.	Marikina	12	4.1	118.2	28.8
18.	Muntinglupa				
19.	Pasig				
20.	Pateros				
	RIZAL	903	954.8	30,841.9	32.3

During the regular season or first crop of 1965-66, the area planted to rice was 8,778 hectares with a total production of 523,222 cavans, while during the second crop or dry season, the area planted was only 633 hectares with the production of 30,470 cavans. These figures indicated that only 633 hectares or 6 per cent of the total area planted had irrigation water which were either irrigated by gravity or pump irrigation system. At these point, we need to mention that more efforts should be made in the construction of more irrigation facilities. Also, figures indicated that the productivity during the regular season was 60 cavans per hectare while the palagad was only 48. The low yield during the dry season was attributed to drought.

Also, upland farming in Rizal was quite prevalent with an area planted to around 955 hectares or 10 per cent of the total area planted with a production of 30,842 cavans. The upland rice had a productivity of 32 cavans per hectare.

5.1.2. Tenure Status

Only 29 per cent of the farms in Rizal was fully owned by operators and 5 per cent were partly owned and another 5 per cent were leased by tenants. However, 69 per cent were operated by share tenants. It will be noted that share tenants were more productive than in other form of tenure. Results in Laguna as collected by the author confirmed this findings.

Table 22. NUMBER AND AREA OF FARMS, PRODUCTION IN CAVANS AND PRODUCTIVITY IN CAVANS PER HECTARE, BY TENURE STATUS. RIZAL 1966.

Tenure Status	Number of Farms (#)	(%)	Area (ha)		Production (cavcns)	Productivity (cav./hec.)
Share Tenant	5,861	69	7,177.2	69	431,780.1	60
Full Owner	1,664	20	1,880.1	18	91,930.9	49
Part Owner	438	5	584.7	6	32,353.5	55
Least Tenant	440	5	621.8	6	22,465.4	36
Cash Tenant	9	Nil	18.5	Nil	645.3	35
Others	68	1	83.7	1	5,359.8	64
TOTAL -	8,480	100	10,366.0	100	584,535.0	56

The main reason could be attributed to the fact that a share tenant would like to produce more in order to get a bigger share of the harvest. The share tenants produced an average of 60 cavans per hectare while an owner operator had only 49 cavans.

5.1.3. Size of Farm

In Rizal, 59 per cent of the farms are within 0.1 to 1.0 hectares, 29 percent are within the range of 1.1 to 2.0 and the others fall within the range of 3.1 and above. The same trend is true for the area planted and production. However, the productivity of farms within the range of 0.1 to 1.0 which is 62 cavans per hectare, is higher than in other categories of size of farm.

5.1.4. Mud Depth

The farms in Rizal can be considered as moderately shallow, around 89 percent are below 12 inches in depth. Percentage wise, area planted and production have the same trend of distribution as number of farm. Research findings indicated that mud depth is related to productivity of rice and this was confirmed in Rizal whereby mud depth ranging 9-12 inches had a productivity of 72 cavans per hectare while farms with mud depth below 4 inches had a lower productivity.

Table 23. NUMBER OF FARMS, AREA PLANTED IN HECTARES, PRODUCTION IN CAVANS AND PRODUCTIVITY, BY SIZE OF FARM. RIZAL. 1966.

Size of Farm (ha.)	Number of Farms (#)	Number of Farms (%)	Area Planted (ha)	Area Planted (%)	Production (Cavans)	(%)	Productivity (cavan/hec.)
0.1-1.0	5,015	59	4,057.2	39	253,029.3	43	62
1.1-2.0	2,451	29	3,742.2	36	199,395.5	34	53
2.1-3.0	621	7	1,452.6	14	76,309.7	13	53
3.1-4.0	178	2	570.9	6	29,537.2	5	52
4.1-5.0	64	1	139.3	1	5,355.4	1	38
5.1 and above	151	2	403.8	4	20,907.9	4	52
RIZAL	8,480	100	10,366.0	100	584,535.0	100	56

Table 24. NUMBER OF FARMS, AREA PLANTED IN HECTARES, PRODUCTION IN CAVANS AND PRODUCTIVITY, BY MUD DEPTH. RIZAL. 1966.

Mud Depth	Number of Farms (#)	(%)	Area Planted (ha)	(%)	Production (cav)	(%)	Productivity (cavans/hec)
Below 1	903	11	954.9	9	30,841.9	5	32
1 - 4	1,634	19	2,870.9	28	104,265.7	18	36
5 - 8	2,305	27	2,588.0	25	161,372.7	28	62
9 - 12	2,692	32	3,001.4	29	216,137.7	37	72
13 - 16	336	4	415.6	4	28,234.2	5	68
17 and up	620	7	535.2	5	43,682.8	7	82
RIZAL	8,480	100	10,366.0	100	584,535.0	100	56

5.1.5. Type of Irrigation

Three types of criteria were used in determining the type of irrigated (with available irrigation water throughout maturity), partly irrigated (irrigation water is available off and on) and rainfed (where the rice farms depend solely upon the rain water). For the first crop or regular season, 746.0 hectares was fully irrigated, 700.5 was partly irrigated and 7,331.3 was rainfed or 97 and 84 percent respectively. During the second crop or dry season, only 633.4 hectares were planted to rice and 60 per cent were fully irrigated, 81 per cent depended on rain water for irrigation. As expected, the productivity of farms with full irrigation was higher than either partly irrigated or rainfed.

5.1.6. Variety Use

There are a number of varieties used in the province.. The most common of which are Intan, Macan, Thailand (also known as Binato), Raminad, BPI-76, BE-3, Tjeremas and others. It will be noted that there are already five seedboard varieties which comprised 50 percent of all varieties planted, were being used by farmers in the province. Around 37 percent of farmers were planting Intan, followed by Macan which was around 50 percent. Areawise and productionwise, the hectarage planted to different varieties follows the same percentage distribution as in the number of farms. In case of productivity,

Table 25. NUMBER OF AREA OF FARMS, PRODUCTION IN CAVANS AND PRODUCTIVITY IN CAVANS PER HECTARE, BY TYPE OF IRRIGATION. RIZAL. 1966.

Type of Irrigation	Number of Farm (#)	Number of Farm (%)	Area (ha)	Production (cavans)	Productivity (cavans/hec)
First Crop					
Fully Irrigated	619	9	746.0	50,099.7	67
Partly Irrigated	465	7	700.5	38,194.2	54
Rainfed	5,688	84	7,331.3	434,928.6	63
Sub-total	6,772	100	8,777.8	523,222.6	60
Second Crop					
Fully Irrigated	483	60	365.9	21,710.8	59
Partly Irrigated	246	31	206.5	6,460.9	31
Rainfed	76	9	61.0	2,298.8	38
Sub-total	805	100	633.4	30,470.5	48
Upland	903		954.8	30,841.9	32
RIZAL	8,480		10,366.0	584,535.0	56

Table 28. NUMBER OF FARMS, AREA PLANTED IN HECTARES PRODUCTION IN CAVANS AND PRODUCTIVITY, BY FERTILIZER USE.. RIZAL, 1966.

Fertilizer Use	Number of Farms (#)	Number of Farms (%)	Area Planted (ha)	Area Planted (%)	Production (cav)	Production (%)	Productivity (cavan/hec.)
None	4,687	55	5,421.1	52	290,641.0	58	54
All Fertilizer	3,793	45	4,944.9	43	293,893.0	50	59
Ammosul	1,531	(40)	2,045.7	(41)	112,838.5	(38)	55
Ammophos	81	(2)	115.7	(2)	6,125.3	(2)	52
Urea	180	(5)	279.0	(3)	15,408.4	(5)	55
Complete	1,819	(48)	2,209.4	(45)	147,360.3	(50)	67
Organic Manure ?	43	(1)	154.8	(3)	2,329.8	(1)	15 ? bull
Guano	129	(3)	133.9	(3)	9,558.8	(3)	71
Others	10	Nil	6.4	Nil	272.9	Nil	43
RIZAL	**8,480**	**100**	**10,366.0**	**100**	**584,535**	**100**	**56**

In terms of area, fertilizers were applied to around 4,944.9 hectares or 48 percent of the total area planted and in 52 percent, fertilizers were not applied. In terms of productivity, no significant difference was indicated with the use of fertilizer. Fertilized farms had a productivity of 59 cavans per hectare while farms not fertilized was 54. Farms using complete fertilizers had a productivity of 67 cavans.

5.1.9. Cost of Production

This section on cost of production will be referred to seeds, fertilizers and chemicals which are all considered as cash costs. Also included are farm operations like:

(1) Seed selection
(2) Seedbed preparation
(3) Plowing
(4) Harrowing
(5) Repair of dikes
(6) Seeding/broadcasting
(7) Pulling, bundling and hauling
(8) Transplanting
(9) Irrigation & drainage
(10) Weeding/replanting
(11) Fertilizer application
(12) Herbicide application
(13) Pesticide application

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(14) Harvesting & threshing
(15) Hauling
(16) Drying
(17) Storing

It was estimated that the total cost of seeds, fertilizers and chemicals on a hectare basis was ₱36.49. Of the total cost, 55 percent was used for seeds, 43 percent for fertilizer and only 2 percent for chemicals.

The cost of farm operations listed above included cash and non-cash costs. Cash costs were those incurred for hiring labor for land preparation, pulling of seedlings, tranplanting and weeding. In some instances, harvesting and threshing was also included. Non-cash costs usually involved farm family labor.

Harrowing, harvesting and threshing comprised more than 60 percent of the farm operations, followed by plowing which was around 20 percent, transplanting was 7.7 percent, 6.6 percent in weeding and the rest were other operations. The average man-days required per hectare in farm operations was 140. Imputing cost using ₱3.50 per day, the total man-day requirements will sum-up to ₱520. Data on cost of production are presented in Tables 29a, 29b and 29c.

Table 29a. COST OF SEEDS, FERTILIZER AND CHEMICALS ON A HECTARE BASIS. RIZAL PROVINCE. 1966.

Municipality	Seeds	Fertilizer	Chemicals	Total
1. Angono	₱ 19.36	₱ 34.57	₱ 3.67	₱ 54.60
2. Baras	13.12	-	0.60	13.72
3. Binangonan	15.68	32.84	0.28	48.80
4. Cainta	21.28	8.21	0.65	30.14
5. Cardona	7.04	5.76	-	12.80
6. Jalajala	25.12	11.31	0.44	36.87
7. Montalban	18.88	5.66	-	24.54
8. Morong	16.80	21.80	0.67	39.27
9. Pililla	15.04	6.53	0.17	21.74
10. San Mateo	19.36	9.12	0.21	26.69
11. Taguig	24.00	15.41	0.17	39.58
12. Tanay	16.32	8.48	0.28	25.08
13. Taytay	24.64	39.00	0.60	64.24
14. Teresa	16.64	10.31	-	26.95
15. Antipolo	14.72	6.39	0.89	22.00
16. Las Pinas	31.68	30.47	0.96	63.11
17. Marikina	24.96	17.72	0.56	43.24
18. Muntinglupa	23.68	23.46	3.98	51.12
19. Pasig	34.56	0.76	-	35.32
20. Pateros	19.84	27.66	2.41	49.91
RIZAL	20.14	15.52	0.83	36.49
PERCENT	55	43	2	100

Table 29b. AVERAGE MAN-DAY REQUIREMENTS OF FARM OPERATIONS PER HECTARE. RIZAL PROVINCE. 1966.

Municipality	Seed Selection	Seedbed Prep'n a/	Plowing a/	Harrowing a/	Dike Repair
	= Man-days =				
1. Angono	0.35	0.60	15.00	36.75	5.00
2. Baras	0.25	0.50	41.50	38.00	5.25
3. Binangonan	1.35	3.75	31.25	63.00	14..35
4. Cainta	1.00	4.25	8.30	22.00	1.85
5. Cardona	1.60	6.75	45.00	25.00	1.85
6. Jalajala	0.85	7.75	31.75	14.50	9.85
7. Montalban	1.35	5.50	14.50	32.25	3.60
8. Morong	0.60	7.50	29.0	37.25	3.60
9. Pililla	0.75	7.00	24.50	28.00	3.85
10. San Mateo	3.35	5.50	35.00	38.00	2.55
11. Tagig	0.90	5.85	24.75	29.25	7.25
12. Tanay	0.50	6.75	64.75	61.75	3.25
13. Taytay	0.60	8.75	27.50	28.00	4.50
14. Teresa	0.35	4.0	14.00	37.50	3.50
15. Antipolo	0.25	5.75	12.75	31.75	2.10
16. Las Pinas	1.25	1.00	20.75	16.50	5.60
17. Marikina	0.25	0.75	23.10	13.00	2.85
18. Muntinglupa	1.00	0.75	10.25	16.75	3.10
19. Pasig	0.60	3.00	43.75	33.50	1.00
20. Pateros	0.50	2.50	9.25	10.00	2.85
RIZAL	0.90	4.50	28.00	31.00	4.50
PERCENT	0.6	3.2	20.1	22.2	3.2

a/ Includes animal days.

Table 29b continued ...

Municipality	Seeding broadctg	Pulling bundling & hauling	Transplant'g	Irrig'n Drainage	Weed'g rep'g	Fert'r appln	Herbicide appl'n
		= Man-days =					
1.	1.00	5.00	4.85	15.50	2.65	0.75	-
2.	0.25	1.75	17.10	9.00	8.00	0.75	-
3.	2.25	4.50	8.86	1.85	9.35	1.15	1.50
4.	0.90	2.50	13.25	0.60	7.50	1.50	2.65
5.	1.25	2.50	9.25	-	13.50	4.50	-
6.	1.35	9.00	[illegible].35	-	8.25	0.25	1.25
7.	0.75	5.35	16.25	1.10	7.65	0.75	-
8.	1.00	3.00	11.85	4.65	9.85	1.25	0.75
9.	0.85	3.35	10.50	2.25	13.75	1.15	1.00
10.	0.85	5.75	11.50	1.50	15.25	1.00	3.50
11.	0.60	6.10	12.85	2.00	17.50	0.75	1.35
12.	2.60	2.50	11.60	22.00	17.85	0.60	-
13.	0.50	3.15	19.35	-	11.50	2.75	0.50
14.	0.50	4.65	17.10	-	1.00	0.90	-
15.	0.25	1.75	7.35	-	8.00	0.90	-
16.	0.35	2.85	13.50	0.35	8.00	1.15	1.00
17.	0.75	6.00	11.75	-	3.35	1.15	0.20
18.	0.50	1.35	5.85	0.60	9.00	1.00	1.35
19.	-	1.50	1.65	-	7.85	-	-
20.	-	1.75	1.75	1.25	5.26	1.00	0.50
RIZAL	0.90	1.85	10.75	4.75	9.15	1.15	1.25
PERCENT	0.6	1.3	7.7	3.4	6.6	0.8	0.9

Table 29b contonued ...

Muni-cipality	Pesticide applicat'n	Harvt'g thresh'g	Hauling	Drying	Storing	Total
		= M a n - d a y s =				
1.	1.75	35.75	-	6.15	1.00	132.10
2.	-	28.00	-	-	0.25	150.6
3.	4.85	22.00	4.15	5.35	-	179.50
4.	-	25.25	4.75	1.25	-	97.45
5.	-	45.35	5.25	1.00	-	162.30
6.	-	17.25	1.35	1.75	-	112.50
7.	-	23.00	6.85	2.40	2.35	123.65
8.	-	27.00	4.65	1.75	-	143.70
9.	-	38.00	7.50	14.15	2.25	158.85
10.	-	31.00	1.15	1.75	-	157.95
11.	-	17.85	1.15	7.65	-	135.80
12.	-	28.65	1.65	2.35	-	226.80
13.	0.60	70.00	0.35	-	-	178.05
14.	1.00	17.50	2.25	3.00	-	107.25
15.	1.00	22.85	3.25	5.00	-	102.95
16.	-	22.00	1.50	1.75	-	97.55
17.	-	34.35	2.00	1.25	-	100.75
18.	-	40.25	9.35	-	-	110.10
19.	1.00	34.75	-	-	-	129.10
20.	0.50	31.00	-	-	-	74.10
RIZAL	1.50	30.65	3.50	3.75	1.45	139.55
PERCENT	0.9	22.0	2.5	2.7	1.0	99.7

Table 29c. VALUE OF FARM OPERATIONS. RIZAL PROVINCE. 1966.

	Municipality	Seed Selection	Seedbed Prep'n a/	Plow-ing a/	Harrow-ing a/	Dike Repair
			=	p e s o s	=	
1.	Angono	1.20	2.80	150.00	106.00	17.60
2.	Baras	0.85	1.70	144.00	94.40	18.05
3.	Binangonan	6.75	13.60	86.40	228.00	49.30
4.	Cainta	3.75	18.00	112.20	60.00	6.60
5.	Cardona	5.60	24.00	156.00	116.60	6.45
6.	Jalajala	3.05	25.40	177.20	53.50	33.85
7.	Montalban	4.90	22.80	50.00	111.80	12.60
8.	Morong	2.20	26.00	81.80	135.60	12.55
9.	Pililla	20.65	16.00	124.80	39.60	13.50
10.	San Mateo	11.70	17.50	200.00	133.80	9.75
11.	Tagig	8.10	28.00	90.40	103.60	25.00
12.	Tanay	1.85	23.80	252.00	218.00	11.05
13.	Taytay	2.00	30.60	106.00	97.00	15.50
14.	Teresa	1.30	11.20	43.20	181.10	11.50
15.	Antipolo	0.90	11.10	88.20	274.40	7.30
16.	Las Pinas	4.20	4.30	60.00	67.60	19.35
17.	Marikina	0.75	2.90	85.00	44.00	10.05
18.	Muntinglupa	3.50	2.50	.50.00	.55.00	10.60
19.	Pasig	2.05	10.20	153.80	117.60	5.15
20.	Pateros	1.75	17.30	27.50	51.00	9.85
	RIZAL	4.40	15.50	112.30	114.00	15.30

a/ Includes animal days.

Table 29c continued ...

Muni- cipality	Seeding broadctg	Pulling bundling & hauling	Trans- plant'g	Irrig'n Drainage	Weed'g rep'g	Fert'r appln	Herbicide appl'n
		= p e s	o s =				
1.	3.50	17.30	30.90	51.20	34.75	2.60	-
2.	0.85	6.30	60.00	30.95	27.50	0.85	-
3.	7.50	17.00	40.90	6.65	32.65	3.80	5.25
4.	2.95	6.00	24.00	1.85	24.80	5.25	0.90
5.	4.15	9.20	48.00	-	47.00	14.00	-
6.	4.65	41.00	55.00	-	22.00	0.70	4.35
7.	2.60	26.00	45.00	3.60	26.55	2.50	-
8.	3.50	10.75	47.00	15.95	35.90	4.55	2.80
9.	2.80	6.40	-	7.95	47.60	3.70	3.50
10.	2.85	24.30	37.00	5.25	48.20	3.45	12.00
11.	2.30	15.80	61.00	7.00	61.30	2.65	5.00
12.	9.20	11.80	61.00	77.30	62.45	2.30	-
13.	1.55	10.40	60.00	-	40.25	9.60	1.70
14.	1.55	30.30	43.00	-	3.65	2.80	-
15.	1.00	4.00	32.00	-	27.90	3.00	-
16.	1.05	10.20	40.00	1.30	27.90	3.80	3.50
17.	0.75	9.60	40.00	-	11.90	4.05	0.60
18.	1.65	7.40	22.00	2.35	29.80	3.50	4.55
19.	-	12.00	12.20	-	27.50	-	-
20.	-	4.70	4.70	5.55		1.45	1.95
RIZAL	3.00	14.00	41.25	16.70	32.75	4.00	3.80

Table 29c continued ...

Municipality	Pesticide applicat'n	Harvt'g thresh'g	Hauling	Drying	Storing	Total
			= pesos =			
1.	5.05	123.00	-	20.10	3.40	569.40
2.	-	96.30	-	-	0.85	482.60
3.	17.70	75.70	13.95	18.50	-	623.65
4.	-	86.85	35.00	4.30	-	392.45
5.	-	156.10	18.10	3.30	-	608.50
6.	-	59.35	4.75	6.40	-	491.20
7.	-	79.10	23.65	18.85	6.15	436.10
8.	-	92.90	15.85	6.10	-	493.45
9.	-	130.70	25.50	48.40	7.75	498.85
10.	-	106.65	3.65	6.20	-	622.40
11.	-	61.50	4.05	26.10	-	502.80
12.	-	98.45	5.35	7.90	-	842.45
13.	5.25	240.80	1.30	-	-	621.95
14.	3.50	60.20	7.80	10.30	-	411.40
15.	3.50	78.70	11.20	17.20	-	560.40
16.	-	75.70	2.25	5.80	-	310.95
17.	-	118.25	6.10	4.30	-	338.25
18.	-	138.45	32.25	-	-	371.95
19.	3.50	119.55	-	-	-	463.55
20.	1.95	106.65	-	-	-	251.15
RIZAL	5.30	105.25	13.15	13.60	4.50	519.30

5.1.10. Comparison of Yield

According to the 1960 Census of Agriculture, the province of Rizal ranks fourth in terms of productivity with 35.1 cavans per hectare. Laguna, the province which should lead other provinces in terms of agricultural productivity because of nearness to U.P. College of Agriculture was only fifth with a productivity of 34.9 cavans per hectare.

With the implementation of a rice program in Rizal, the rice productivity increased tremendously whereby it could already rank first. If a rice production program could be implemented in all rice producing provinces and produced the same impact as in Rizal, it could safely be told that the Philippines reached the stage of self-sufficiency in rice.

Recent figures indicated that our country has now a surplus of rice and besides exporting rice seeds, milled rice are also being exported.

b. With Other Countries

The Philippines has an all-time low productivity of 27 cavans per hectare, ranking only 12th among the 15 Asian countries. Japan has a record yield of 113 cavans per hectare, followed by Taiwan with 77 and South Korea with 75 cavans.

Table 30 COMPARISON OF AREA PLANTED AND PRODUCTIVITY. RICE CROP. PHILIPPINES. 1960

Rank	Province	Area Planted (hectare)	Productivity (cavan/hec.)
1	Nueva Viscaya	30,970	44.6
2	Nueva Ecija	167,262	38.5
3	PAmpanga	73,594	35.2
4	Rizal	15,046	35.1
5	Laguna	39,325	34.9
6	Bulacan	67,731	34.1
7	Bataan	20,111	33.7
8	Tarlac	97,114	33.7
9	Ilocos Norte	30,023	32.8
10	Negros Occidental	83,478	32.4
11	Capiz	54,214	31.6
12	Zambales	19,826	31.5
13	Isabela	112,879	30.3
14	Cagayan	87,146	29.6
15	Pangasinan	124,902	28.5
16	Mountain Province	56,035	27.6
17	Misamis Oriental	8,202	27.4
18	Albay	50,476	27.2
19	Lanao del Norte	24,852	27.1
20	Cavite	34,557	26.9
21	Lanao del Sur	54,416	26.2
22	Oriental Mindoro	45,957	26.6
23	Cotabato	251,279	26.1
24	Sorsogon	27,298	25.9
25	Palawan	19,853	25.8
26	Camarines Sur	112,277	25.1
27	Sulu	14,917	24.7
28	Iloilo	157,700	24.6
29	Negros Oriental	17,911	24.3
30	Occidental Mindoro	21,581	24.0
31	Cebu	3,819	23.3
32	Camarines Norte	14,970	23.0
33	Samar	102,133	23.0
34	Abra	22,436	22.9
35	La Union	23,941	22.8
36	Surigao del Norte	14,903	22.8
37	Aklan	24,150	22.6
38	Misamis Occidental	13,785	22.6
39	Leyte	74,689	22.5
40	Ilocos Sur	27,344	22.4
41	Quezon	60,633	22.2

Table 30 continued . . .

42	Catanduanes	10,275	22.2
43	Southern Leyte	8,510	22.0
44	Bohol	44,883	21.7
45	Agusan	18,449	21.4
46	Bukidnon	23,556	21.3
47	Batangas	69,799	20.1
48	Antique	39,978	19.8
49	Batanes	79	19.6
50	Romblon	10,114	19.1
51	Masbate	28,602	18.2
52	Zamboanga del Sur	68,349	17.0
53	Davao	43,911	16.8
54	Zamboanga del Norte	18,548	14.9
55	Surigao del Sur	25,939	14.4
56	Marinduque	16,474	13.6
	Philippines	2,730,394	27.1

Source of basic data: 1960 Census of Agriculture

With the present trend of rice program in the Philippines and following the example set by the province of Rizal, a productivity of 80 cavans could easily be hit. However, the yield of rice in upland culture considerably decrease the national average wherein almost 10 percent of the area are planted, but still a target of 50 or 60 cavans could be easily met. Another factor, rice production must only be concentrated in rice provinces in Cagayan Valley, Central Luzon, Southern Luzon and Bicol and the provinces of Iloilo and Cotabato. Because these provinces are potential rice areas, all requirements for rice production like supplies, materials, credit, machineries, irrigation and the like should be made available. Instead of cultivating rice in less productive areas, other crops could be planted.

Table 31. RICE PRODUCTIVITY IN CAVANS PER HECTARE AMONG ASIAN COUNTRIES. 1963-64.

Rank	*Country*	*Area (ha)*	*Productivity (cavan/hec.)*
1	Japan	3,267,852	113
2	Taiwan	764,074	77
3	South Korea	1,133,160	75
4	Malaysia	396,606	58
5	South Vietnam	2,327,025	47
6	Ceylon	513,969	44
7	Indonesia	7,284,600	40
8	Burma	4,775,460	47
9	India	34,197,150	35
10	Pakistan	9,880,345	34
11	Thailand	5,600,239	33
12	Philippines	3,156,660	27
13	Cambodia	1,173,630	25
14	Nepal	1,375,980	21
15	Laos	566,580	17

Source of basic data: Rice Journal. August 1964.

5.2. Levels of Productivity and Technology

5.2.1. Impact of Productivity

a. Regular Season, 1966

At the start of the ADCR program, 48 farmers planted IR8 in an area of more than 45 hectares. The production was roughly 5,500 cavans with an average productivity of 117 cavans per hectare. The yield data is presented in Table 20.

The steps and procedures in implementing the initial project are recounted in Sections 4.11 and 4.12. Actually, these farms were usedfor demonstrating the concept of modern rice technology in the province. They became the core of farmer cooperators of the rice production program of the ADCR. These farmers were the nucleus of seed production program which was eventually distributed not only within the province but also throughout the Philippines. A part of the seeds produced was also exported to other countries.

It is assumed that small-size farms will yield more than big-size farms because of the extensive cultivation could be employed in a rather small area but results turned out otherwise. An evidence to this effect is shown in Table 23. Big-size farms yield more per hectare. The farm with an area of 1.522 hectares produced 227 cavans per hectare while the 0.472-hectare farm yielded only 138 cavans per hectare. The two farms described above were top producers in two categories of the Rice Production Contest: above 0.75 hectare and below 0.75 hectare, respectively. Reasons could be attributed to production inputs availed to the farm. On a hectare basis, the 1.522-hectare farm incurred ₱450 for cost of cash inputs while the 0.472-hectare farm incurred only ₱317. In terms of fertilizer application, the rate of 125N-37P-37K was applied to the big farm and only 95N was applied to the small farm.

A more thorough soil analysis should be done for a fair recommendation of fertilizer to rice farms. Other factors are also involved like weed control, prevalence of pests and diseases and weather at the time of harvest which could greatly affect rice yield but no records were available.

b. Palagad Season, 1967

Before the season commenced, an intensive information campaign was conducted by the ADCR to let farmers plant the new high yielding variety of rice called IR8. Nightly meetings and information campaign with farmers were made in order to impart to them the basic and modern cultural requirements of rice and the overall agricultural development program of the ADCR. This aspect should never be neglected in the implementation of rice production program. Farmers should be duly informed of any activities which will involve their participation. It had been very helpful in the implementation of agricultural projects being launched in the province.

As a result of this campaign, around 716 farms were planted to IR8 with an area of 525 hectares and a total production of 67,000 cavans. The productivity during this season was 128 cavans per hectare. For farmers planting varieties other than IR8, the number was 1,534 planting an area of 1,100 hectares with a total production of only 78,000 cavans. As compared to the yield of IR8, the productivity of other varieties combined was only 71 cavans per hectare. Thus, the total area planted in Rizal was 1,625 hectares with an average productivity of 89 cavans per hectare. This means that with the introduction of IR8, it gave a yield difference of 80 percent higher than ordinary varieties with an area difference of 109 percent. Refer to Tables 32 to 34.

The total hectarage planted during this season was so tremendous so much so that area planted increased to 157 percent while production to 184 as compared to last year's performance. The most significant changes were in Cardona, Jalájala, Baras, Pililla, Binangonan and Tanay. However, Cainta never planted the dry season crop. All other municipalities have substantial increases both in area and production.

Table 32a. PALAY: NUMBER, AREA AND PRODUCTION IN CAVANS, BY VARIETY, BY MUNICIPALITY. RIZAL. PALAGAD SEASON, 1967.

	Municipality	IR8			Other Varieties		
		No.	Area	Production	No.	Area	Production
1.	Angono	30	15.0	2960	0	0	0
2.	Baras	63	27.2	3288	217	170.8	8,542
3.	Binangonan	51	30.3	5151	312	201.1	13,474
4.	Cainta	0	0	0	0	0	0
5.	Cardona	3	1.4	219	75	37.2	3,462
6.	Jalajala	12	8.5	680	0	0	0
7.	Montalban	10	6.1	909	3	1.5	78
8.	Morong	250	144.2	14,563	643	422.5	37,181
9.	Pililla	47	34.7	4,237	146	114.5	6,296
10.	San Mateo	30	36.5	5,548	4	2.2	132
11.	Taguig	7	8.0	928	31	43.2	2,549
12.	Tanay	118	119.0	18,921	45	39.0	2,262
13.	Taytay	9	8.5	1,615	27	25.0	875
14.	Teresa	26	86.6	1,989	0	0	0
15.	Antipolo	35	38.6	2,667	0	0	0
16.	Las Pinas	1	0.3	40	0	0	0
17.	Marikina	2	1.2	78	0	0	0
18.	Muntinglupa	15	17.2	1,690	10	8.2	355
19.	Pasig	8	10.0	1,550	21	35.0	2,800
20.	Pateros	-	-	-	-	-	-
	RIZAL	717	525.3	67,033	1,534	1,100.3	78,006

Table 32b. PALAY: NUMBER, AREA AND PRODUCTION, ALL VARIETIES, BY MUNICIPALITY. RIZAL. PALAGAD SEASON, 1967.

Municipality	All Varieties		
	No.	Area	Production
1. Angono	30	15.0	2,960
2. Baras	280	198.0	11,830
3. Binangonan	363	231.4	18,625
4. Cainta	0	0	0
5. Cardona	78	38.6	3,681
6. Jalajala	12	8.5	680
7. Montalban	13	7.6	987
8. Morong	893	566.7	51,744
9. Pililla	193	149.2	10,533
10. San Mateo	34	38.7	5,680
11. Taguig	38	51.2	3,477
12. Tanay	163	158.0	21,183
13. Taytay	36	33.5	2,490
14. Teresa	26	18.6	1,989
15. Antipolo	35	38.6	2,667
16. Las Pinas	1	0.3	40
17. Marikina	2	1.2	78
18. Munitinglupa	25	25.5	2,045
19. Pasig	29	45.0	4,350
20. Pateros	0	0	0
RIZAL	2,251	1,625.6	145,039

Table 33. PALAY: COMPARISON OF PRODUCTIVITY BY VARIETY, BY MUNICIPALITY. RIZAL PALAGAD SEASON, 1967.

	Municipality	IR8 cavan/hec.)	Other Varieties (cavan/hectare)	All Varieties (cavan/hectare)
1.	Angono	198	0	198
2.	Baras	121	50	60
3.	Binangonan	170	67	80
4.	Cainta	0	0	0
5.	Cardona	160	93	95
6.	Jalajala	80	0	80
7.	Montalban	149	52	130
8.	Morong	101	88	91
9.	Pililla	122	44	71
10.	San Mateo	152	60	147
11.	Taguig	116	59	68
12.	Tanay	159	58	134
13.	Taytay	190	35	74
14.	Teresa	107	0	107
15.	Antipolo	69	0	69
16.	Las Pinas	133	0	133
17.	MArikina	65	0	65
18.	Muntinglupa	98	43	80
19.	Pasig	155	80	97
20.	Pateros	0	0	0
	RIZAL	128	71	89

Table 34. CHANGE IN AREA PLANTED AND PRODUCTION IN 1966 AND 1967 IN PERCENT. – RIZAL. PALAGAD SEASON, 1967.

Municipality	1966		1967		Percent Change In	
	Area	Prodn.	Area	Prodn.	Area	Prodn.
1. Angono	8	719	15	2960	82	812
2. Baras	40	1598	198	11830	395	640
3. Binangonan	72	4112	231	18625	222	353
4. Cainta	0	0	0	0	0	0
5. Cardona	4	322	39	3681	972	1043
6. Jalajala	2	132	8	680	400	415
7. Montalban	0	0	8	987	100	100
8. Morong	288	12383	567	51744	97	318
9. Pililla	41	1304	179	10533	261	708
10. San Mateo	0	0	39	5680	100	100
11. Taguig	17	1247	51	3477	205	179
12. Tanay	113	6313	158	21183	40	236
13. Taytay	0	0	34	2490	100	100
14. Teresa	0	0	19	1989	100	100
15. Antipolo	0	0	39	2667	100	100
16. Las Piñas	18	684	0.5	40	99	1610
17. Marikina	0	0	1	78	100	100
18. Muntinglupa	31	1656	26	2045	17	23
19. Pasig	0	0	45	4350	100	100
20. Pateros	0	0	0	0	0	0
RIZAL	633	30470	1626	145039	157	184

c. Regular Season, 1967

There has been a notable decrease in production for the regular season of 1967 as compared to the regular season of 1966. This can be explained by the fact that ADCR launched the program in 48 farms and therefore technical assistance extended by field workers had became so intensive that farmers planting ordinary varieties were assisted in the same manner as IR8 farms. There was no major weather hazard at this time. However, in 1967, although hectarage was increased from 525 to 2,595 hectares or more than 5 times of the palagad of 1966, the decline in production was brought about by typhoon Welming. The same intensity of technical assistance was rendered to farmers.

Around 22 percent of the total area planted was devoted to IR8. The total production of 692,346 cavans was composed of 23 percent IR8 and 77 percent ordinary varieties. The productivity level considerably dropped with only 78 cavans per hectare for high yielding varieties compared to 63 cavans for ordinary varieties. The provincial average was 66 cavans per hectare and no significant difference from last year's average of 64 cavans. The area difference of 2 percent in 1966 and 1967 brought about to 9 percent difference in production. This season did not create much impact as the palagad but the respond was great in terms of area planted.

Table 35. PALAY: AREA IN HECTARES AND PRODUCTION IN CAVANS PER HECTARE, BY VARIETY, BY MUNICIPALITY. RIZAL. REGULAR SEASON, 1967.

	Municipality	High Yielding Varieties		Ordinary Varieties		All Varieties	
		Area*	Prodn.	Area	Prodn.	Area	Prodn.
1.	Angono	10.0	1170	130.7	949	140.7	2119
2.	Baras	290.5	11039	25.5	2270	316.0	13309
3.	Binangonan	150.5	12040	1,278.2	80527	1428.7	92567
4.	Cainta	21.5	1570	547.0	30085	568.5	31655
5.	Cardona	13.7	1671	61.3	3984	75.0	5685
6.	Jalajala	55.0	4675	183.0	9150	238.0	13825
7.	Montalban	107.0	4774	665.0	37240	772.0	46014
8.	Morong	561.2	35356	623.2	38638	1184.4	73994
9.	Pililla	129.3	10990	591.8	36100	721.1	47090
10.	San Mateo	157.0	8478	450.0	27900	607.0	36378
11.	Tagig	30.5	1464	738.7	36935	769.2	38399
12.	Tanay	393.5	20856	218.7	16184	612.2	37040
13.	Taytay	16.8	1764	374.7	25105	391.5	26869
14.	Teresa	437.0	23598	391.5	19966	828.5	23564
15.	Antipolo	85.4	4099	1041.6	74995	1127.0	79094
16.	Las Pinas	11.0	1449	522.5	31350	533.5	32799
17.	Marikina	29.4	1499	152.6	10072	182.0	11571
18.	Muntinglupa	48.0	3360	306.8	18715	354.8	22075
19.	Pasig	37.4	5386	656.3	27565	693.7	32951
20.	Pateros	10.0	600	52.5	4778	62.5	5378
	RIZAL	2594.7	159838	9020.6	532508	11606.3	692346

* Around 50 hectares were planted to C4-63 and sporadic trial plantings of IR5.

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Table 36. PALAY: COMPARATIVE PRODUCTIVITY OF HIGH YIELDING VARIETIES AND ORDINARY VARIETIES. RIZAL. REGULAR SEASON, 1967.

Municipality		High Yielding Varieties IR8	Others*	All HYV	Ordinary Varieties	All Varieties
1.	Angono	117	-	117	70	94
2.	Baras	40	-	40	89	48
3.	Binangonan	91	52	80	63	76
4.	Cainta	136	23	73	55	56
5.	Cardona	130	110	122	65	97
6.	Jalajala	109	52	85	50	73
7.	Montalban	84	75	82	56	60
8.	Morong	68	38	63	62	62
9.	Pililla	85	68	85	61	70
10.	San Mateo	49	64	54	62	57
11.	Tagig	49	48	48	50	50
12.	Tanay	52	111	53	74	60
13.	Taytay	-	105	105	67	69
14.	Teresa	49	72	54	51	53
15.	Antipolo	47	49	48	72	66
16.	Las Pinas	198	70	129	60	66
17.	Marikina	51	-	51	66	63
18.	Muntinglupa	70	77	70	61	64
19.	Pasig	-	144	144	42	92
20.	Pateros	-	60	60	91	44
	RIZAL	84	72	78	63	66

* Includes IR5, C4 and BPI-76 varieties.

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Table 37. CHANGE IN AREA PLANTED AND PRODUCTION IN 1966-1967 IN PERCENT. RIZAL. REGULAR SEASON, 1967.

Municipality		1966 Area	1966 Prodn.	1967 Area	1967 Prodn.	Percent Change in Area	Percent Change in Prodn.
1.	Angono	194	18409	141	2119	(27)*	(88)
2.	Baras	53	3242	316	13309	496	211
3.	Binangonan	445	25284	1429	92567	221	166
4.	Cainta	378	22372	568	31655	50	41
5.	Cardona	73	3723	75	5655	3	52
6.	Jalajala	448	21746	238	13825	(47)	(36)
7.	Montalban	440	35968	772	46014	75	28
8.	Morong	2470	167393	1184	73994	(52)	(56)
9.	Pililla	426	27557	721	47090	69	71
10.	San Mateo	626	46752	607	36378	(3)	(22)
11.	Tagig	1031	51189	769	38399	(25)	(25)
12.	Tanay	541	33142	612	37040	13	12
13.	Taytay	155	9301	392	26869	153	89
14.	Teresa	433	28006	828	43564	91	56
15.	Antipolo	718	55658	1127	78094	57	42
16.	Las Pinas	909	60256	534	32799	(42)	(46)
17.	Marikina	516	32613	182	11571	(65)	(65)
18.	Muntinglupa	704	31945	355	22075	(50)	(31)
19.	Pasig	1199	392	694	32951	(42)	(58)
20.	Pateros	55	2593	62	5378	(13)	107
	RIZAL	11814	758542	11606	692346	2	9

* Figures in ( ) negative values.

Table 38. PALAY: COMPARISON OF PRODUCTIVITY, BY SEASON, 1966 and 1967, BY MUNICIPALITY. RIZAL PROVINCE. 1968.

Municipality	1966		1967	
	Palagad	Regular	Palagad	Regular
1. Angono	88	95	198	94
2. Baras	40	61	43	48
3. Binangonan	57	52	132	76
4. Cainta	-	59	-	56
5. Cardona	90	51	95	97
6. Jalajala	77	44	80	73
7. Montalban	-	82	129	60
8. Morong	43	68	91	62
9. Pililla	32	65	71	70
10. San Mateo	-	75	147	57
11. Tagig	74	50	68	50
12. Tanay	56	64	134	60
13. Taytay	-	60	74	69
14. Teresa	-	65	107	53
15. Antipolo	-	77	69	66
16. Las Pinas	37	66	133	66
17. Marikina	-	63	65	63
18. Muntinglupa	54	50	80	64
19. Pasig	-	65	97	92
20. Pateros	-	47	0	44
RIZAL	48	64	89	66

5.2.2. Impact on Technology

a) Effect of High Yielding Varieties

The introduction of certified seeds is not uncommon among rice farmers in the province. A recent survey revealed that seedboard varieties were by now popularly planted by many farmers in Rizal. Some of these varieties were Intan, BPI-76, Raminad and BE-3. This is the reason why the province, initially, had a high level of productivity. In the regular season of 1966, the 45 hectares of IR8 or 0.5 percent of the total rice area planted made a substantial contribution which was doubled in terms of production percentage or one percent of total yield since IR8 reached a towering yield of 117 cavans per hectare. Ordinary varieties averaged 60 cavans per hectare during the same season.

Of the 2,251 farmers planting in palagad of 1967, 717 or 32 percent planted IR8 and 1,534 or 68 percent remained using ordinary varieties. Accordingly, 525 hectares (25%) were planted with high yielding varieties against 1,100 hectares (75%) were planted to ordinary varieties. Productionwise, of the 145,000 cavans total production, 46 percent was contributed by IR8 and 54 percent by ordinary varieties. This can be reasoned out by the high productivity of IR8 (128 cavans per hectare), while other

Table 39. COMPARISON OF HIGH YIELDING VARIETIES AND ORDINARY VARIETIES. RIZAL. PALAGAD AND REGULAR SEASON, 1967.

Varieties	1967 Palagad	Percent (%)	1967 Regular	Percent (%)
High Yielding Varieties				
Number	717	32	3,529	22
Area Planted (ha)	526	25	2,595	22
Production (cavans)	67,003	46	159,838	23
Productivity (cav/ha)	128		78	
Ordinary Varieties				
Number	1,534	68	12,539	78
Area Planted (ha)	1,100	75	9.021	78
Production (cavan)	78,006	54	532,508	77
Productivity (cav/ha)	71		63	
All Varieties				
Number	2,251	100	16,068	100
Area Planted (ha)	1,626	100	11,616	100
Production (cavan)	145,009	100	692,346	100
Productivity (cav/ha)	89		66	

varieties yielded only 71 cavans. Productivity for all varieties averaged 89 cavans per hectare.

Some 11,507 farmers planted an area of 11,616 during the regular season. 22 percent planted IR8 and 78 percent sticked to ordinary varieties. It was expected that high yielding varieties will turn out a good harvest, but flood caused by typhoons struck many areas thus limiting its potentialities to only 23 percent of the total production of 692,346 cavans while ordinary varieties to 77 percent. Fertilizer and chemical use, because of of its limited application affected the decline in production too. Yield was 78 cavans per hectare for heavy yielders and 63 cavans for ordinary varieties. The overall productivity was 66 cavans per hectare.

b) Fertilizer Use

Of the total area planted to rice, 95 percent was fertilized and only 5 percent did not use any in 1967 palagad season. The aggregate volume of fertilizer applied in the province was approximately 5,738 bags. Of this total amount, 52 percent was used in IR8 farms and 48 per cent to other farms. IR8 farmers used an average of 111 kgm nitrogen whereas ordinary varieties used up 35 kgm nitrogen per hectare. The average nitrogen application was 78 kgm per hectare. The amount of phosphorous applied averaged 19 kgm and potassium was 14 kgm per hectare.

Table 40a. TOTAL NITROGEN FERTILIZER APPLIED IN BAGS, BY VARIETY AND BY MUNICIPALITY. RIZAL PROVINCE. PALAGAD SEASON, 1967.

	Municipality	Nitrogen Fetilizer Applied (bags)		
		HYV	Others	All
1.	Angono	104	-	104
2.	Baras	225	372	597
3.	Binangonan	364	670	1,034
4.	Cainta	-	-	-
5.	Cardona	3	76	79
6.	Jalajala	38	-	38
7.	Montalban	25	1	26
8.	Morong	519	1,127	1,646
9.	Pililla	176	372	548
10.	San Mateo	178	2	180
11.	Tagig	24	29	53
12.	Tanay	1,063	16	1,079
13.	Taytay	26	14	40
14.	Teresa	55	-	55
15.	Antipolo	76	-	76
16.	Las Pinas	-	-	-
17.	Marikina	-	-	-
18.	Muntinglupa	91	5	96
19.	Pasig	26	61	87
20.	Pateros	-	-	-
	RIZAL	2,993	2,745	5,738
	PERCENT	52	48	100

Note: One bag equals 50 kg.

Table 40b. RATE OF FERTILIZER APPLICATION IN KILOGRAMS PER HECTARE. RIZAL PROVINCE. PALAGAD SEASON, 1967.

Municpality		Nitrogen HYV	Nitrogen Others	Nitrogen All	P	K
		= in Kgm. per hectare =				
1.	Angono	156	-	156	17	11
2.	Baras	186	49	68	63	39
3.	Binangonan	270	75	101	9	3
4.	Cainta	-	-	-	-	-
5.	Cardona	45	46	46	-	-
6.	Jalajala	100	-	100	14	7
7.	Montalban	91	17	76	25	25
8.	Morong	81	60	65	12	7
9.	Pililla	114	73	83	3	2
10.	San Mateo	110	22	105	35	35
11.	Tagig	66	15	23	-	-
12.	Tanay	201	90	154	31	18
13.	Taytay	68	13	27	23	23
14.	Teresa	66	-	66	6	6
15.	Antipolo	44	-	44	9	7
16.	Las Pinas	-	-	-	-	-
17.	Marikina	-	-	-	-	-
18.	Muntinglupa	119	13	84	14	-
19.	Pasig	59	39	43	5	5
20.	Pateros	-	-	-	-	-
	RIZAL	111	35	78	19	14

Table 41a. TOTAL NITROGEN FERTILIZER APPLIED IN BAGS, BY VARIETY AND BY MUNICIPALITY. RIZAL PROVINCE. REGULAR SEASON, 1967.

Municipality		Nitrogen Fertilizer Applied (bags)		
		HYV	Others	All
1.	Angono	20	70	90
2.	Baras	478	28	506
3.	Binangonan	361	65	426
4.	Cainta	65	292	357
5.	Cardona	35	79	114
6.	Jalajala	20	73	93
7.	Montalban	104	355	456
8.	Morong	1,023	803	1,826
9.	Pililla	195	526	721
10.	San Mateo	363	240	603
11.	Tagig	30	230	260
12.	Tanay	402	68	470
13.	Taytay	46	200	246
14.	Teresa	1,282	470	1,752
15.	Antipolo	156	1,157	1,313
16.	Las Pinas	-	-	-
17.	Marikina	34	372	406
18.	Muntinglupa	66	183	249
19.	Pasig	-	350	350
20.	Pateros	6	42	48
	RIZAL	4,686	5,603	10,289
	PERCENT	46	54	100

Note: One bag equals 50 kg.

Table 41b. RATE OF FERTILIZER APPLICATION IN KILOGRAMS PER HECTARE. RIZAL PROVINCE. REGULAR SEASON, 1967.

	Municipality	Nitrogen			P	K
		HYV	Others	All		
			= in kgm. per hectare =			
1.	Angono	46	12	14	-	-
2.	Baras	37	25	36	14	14
3.	Binangonan	54	36	39	21	21
4.	Cainta	68	12	14	16	11
5.	Cardona	58	29	34	11	11
6.	Jalajala	8	9	9	12	12
7.	Montalban	22	12	13	14	1
8.	Morong	41	29	35	12	5
9.	Pililla	34	20	23	23	13
10.	San Mateo	52	12	22	17	10
11.	Tagig	22	7	8	7	7
12.	Tanay	23	7	17	15	15
13.	Taytay	61	12	14	8	6
14.	Teresa	66	27	48	17	17
15.	Antipolo	41	25	26	11	6
16.	Las Pinas	-	-	-	11	.9
17.	Marikina	26	12	14	25	11
18.	Muntinglupa	31	15	17	12	12
19.	Pasig	-	12	11	15	0
20.	Pateros	13	18	17	4	4
	RIZAL	39	18	22	14	10

Table 42. FERTILIZER EXPENSES PER HECTARE IN PESOS, BY SEASON, BY MUNICIPALITY. RIZAL PROVINCE. 1967

	Municipality	1967 Palagad Season		1967 Regular Season	
		HYV	Others	HYV	Others
1.	Angono	₱ 140.40	-	₱ 56.52	₱ 35.50
2.	Baras	137.60	₱ 10.50	75.17	27.65
3.	Binangonan	223.70	45.15	90.57	37.22
4.	Cainta	180.65	54.85	2.95	311.14
5.	Cardona	161.90	-	149.57	30.87
6.	Jalajala	167.80	80.00	50.18	14.57
7.	Montalban	-	-	80.46	11.67
8.	Morong	121.65	44.40	43.82	32.33
9.	Pililla	86.40	2.45	59.59	70.41
10.	San Mateo	153.40	57.60	21.35	11.32
11.	Tagig	166.45	17.40	23.60	7.70
12.	Tanay	242.90	6.40	45.17	5.72
13.	Taytay	236.35	6.00	66.93	15.90
14.	Teresa	76.85	-	94.84	57.43
15.	Antipolo	88.95	-	45.84	29.87
16.	Las Pinas	-	-	60.00	31.68
17.	Marikina	-	-	72.67	14.89
18.	Muntinglupa	128.80	20.85	34.07	33.25
19.	Pasig	-	34.25	-	15.14
20.	Pateros	-	-	14.05	19.68
	RIZAL	₱147.25	₱31.76	₱57.76	₱40.70

averaged 19 kgm and potassium was estimated to be 12 kgm per hectare.

During the regular season, almost 10,289 bags was applied in rice farms of the province. On farms of high yielding varieties, 46 percent was used as compared to 54 bags in farms planted to other varieties. The average nitrogen application was 39 kgm for high yielding varieties and 18 kgm for ordinary varieties. The rate of N-P-K application was computed to be 22 kgm per hectare of N, 14 kgm of P and 10 kgm of K.

In 1967 palagad season, expenses for fertilizers was high or ₱145.25 for high yielding and ₱31.76 for ordinary varieties as compared to low expenditures in regular season which was only ₱57.76 and ₱40.70, respectively. This, therefore, reflected the extent of fertilizer use.

c) Chemical Use*

In 1967 palagad season, 73 percent of the total area planted were treated with chemicals and 27 percent without any treatment and contributing 82 and 18 percent to total production. As a result, farms applied with chemicals yielded 102 cavans per hectare while areas with no treatment at all gave a yield of 60 cavans .

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*Chemicals will be referred to pesticide and weedicide.

Table 43 . CHEMICAL USE: AREA AS PERCENTAGE OF TOTAL AND PRODUCTIVITY IN CAVANS PER HECTARE. RIZAL PROVINCE. PALAGAD SEASON, 1967.

Municipality	With Chemical		Without Chemical	
	Area (%)	Prod'ty (cav/ha)	Area (%)	Prod'ty (cav/ha)
1. Angono	1	-	-	-
2. Baras	4	118	5	66
3. Binangonan	11	98	2	39
4. Cainta	-	-	-	-
5. Cardona	1	126	3	87
6. Jalajala	3	27	-	-
7. Montalban	1	123	1	32
8. Morong	16	98	9	89
9. Pililla	7	106	2	53
10. San Mateo	2	124	1	83
11. Tagig	4	72	1	48
12. Tanay	14	159	-	-
13. Taytay	1	65	1	37
14. Teresa	1	107	-	-
15. Antipolo	2	100	1	39
16. Las Pinas	-	-	-	-
17. Marikina	nil	125	-	-
18. Muntinglupa	2	72	-	-
19. Pasig	3	106	1	56
20. Pateros	-	-	-	-
RIZAL	73	102	27	60

Table 44. CHEMICAL USE: AREA AS PERCENTAGE OF TOTAL PRODUCTIVITY IN CAVANS PER HECTARE. RIZAL PROVINCE. REGULAR SEASON, 1967.

Municipality	With Chemical Area (%)	 Prod'ty (cav/ha)	Without Chemical Area (%)	 Prod'ty (cav/ha)
1. Angono	1	112	nil	52
2. Baras	2	15	nil	32
3. Binangonan	2	77	1	74
4. Cainta	3	64	3	52
5. Cardona	1	107	nil	91
6. Jalajala	6	55	1	43
7. Montalban	4	58	3	64
8. Morong	5	72	5	87
9. Pililla	3	81	1	47
10. San Mateo	2	57	1	6[illegible]
11. Tagig	14	52	6	47
12. Tanay	4	57	1	110
13. Taytay	3	68	nil	68
14. Teresa	1	62	1	[illegible]
15. Antipolo	3	78	2	47
16. Las Pinas	1	54	5	63
17. Marikina	2	76	1	62
18. Muntinglupa	2	65	1	62
19. Pasig	3	63	2	92
20. Pateros	3	43	-	-
RIZAL	66	66	34	62

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Table 45 . CHEMICAL EXPENSES PER HECTARE IN PESOS, BY SEASON, BY VARIETY AND BY MUNICIPALITY. RIZAL PROVINCE. 1967.

Municipality		1967 Palagad Season		1967 Regular Season	
		HYV	Others	HYV	Others
1.	Angono	₱ 125.95	-	₱ 24.50	₱ 2.88
2.	Baras	27.95	₱ 1.80	5.72	3.19
3.	Binangonan	33.90	3.20	7.32	1.11
4.	Cainta	-	-	15.45	1.94
5.	Cardona	145.25	0.45	22.17	-
6.	Jalajala	15.30	-	7.85	4.97
7.	Montalban	112.00	5.60	11.44	1.18
8.	Morong	56.35	3.10	8.74	8.62
9.	Pililla	102.35	7.25	21.75	11.96
10.	San Mateo	79.30	-	34.11	0.86
11.	Tagig	55.65	4.05	0.92	1.66
12.	Tanay	95.15	1.50	29.06	20.45
13.	Taytay	109.15	-	71.54	2.60
14.	Teresa	20.85	-	23.28	4.62
15.	Antipolo	30.00	-	26.52	3.84
16.	Las Pinas	-	-	-	0.80
17.	Marikina	21.20	-	4.92	3.37
18.	Muntinglupa	69.20	3.45	1.87	2.93
19.	Pasig	-	7.85	4.42	4.74
20.	Pateros	-	-	-	1.67
	RIZAL	₱ 64.38	₱ 3.38	₱ 17.86	₱ 4.39

Table 46. PERCENTAGE OF FARMERS ASSISTED AND UNASSISTED BEFORE AND DURING IMPLEMENTATION OF THE ADCR PROGRAM, BY MUNICIPALITY. RIZAL. 1967.

Municipality	Before ADCR		Palagad Season, 1967			
	As.	Unas.	H Y V		Others	
			As.	Unas.	As.	Unas.
1. Angono	-	-	83	17	-	-
2. Baras	-	-	5	95	-	100
3. Binangonan	14	86	43	57	2	98
4. Cainta	-	-	-	-	-	-
5. Cardona	-	-	-	-	-	-
6. Jalajala	-	-	100	-	-	-
7. Montalban	-	-	100	-	100	-
8. Morong	-	-	34	66	15	85
9. Pililla	-	-	10	90	7	93
10. San Mateo	-	-	67	33	100	-
11. Tagig	-	-	100	-	33	67
12. Tanay	-	-	54	46	22	78
13. Taytay	21	79	-	-	-	100
14. Teresa	-	-	60	40	-	-
15. Antipolo	40	60	14	86	-	-
16. Las Pinas	-	-	-	-	-	-
17. Marikina	-	-	100	-	-	-
18. Muntinglupa	-	-	-	-	-	100
19. Pasig	-	-	50	50	25	75
20. Pateros	-	-	-	-	-	-
RIZAL	5	95	40	60	12	88

During the regular season of 1967, 66 percent of the rice area were applied with chemicals while 34 percent were not. Aside from the flood disaster, the reduced percentage on chemically treated farms greatly affected rice yield. Farms with chemical treatment yielded 68 cavans per hectare and 62 cavans for the untreated farms.

Comparing expenses among varieties, in palagad season it was found out that ₱64.38 was spent for chemicals per hectare on high yielding varieties while only ₱3.38 on ordinary varieties. The reduced investment for chemicals influenced the yield of the regular season crop whereby only ₱17.86 and ₱4.39 were spent respectively for high yielding and ordinary varieties.

d) Effect of Credit Use

Before the ADCR's credit program, it was found out that only 5 percent of the total number of farmers were granted production credit (regular season, 1966). But upon the full swing of the credit program, the palagad season allowed 40 percent of IR8 farmers to avail to loans under the ADCR financing agreement with rural banks. 9-12% Nevertheless, some of the 60 percent unassisted farmers were able to finance their farms either by themselves or obtain funds from other sources. Only 12 percent of farmers planting IR8 obtained credit from rural banks and 88 percent did not get any loan support at all.

Credit assistance other than production loans are funds for the construction of gravity irrigation systems (formerly given free by the province), funds for acquisition of pumps and tractors, and commodity or commercial loans. The amount of disbursement was presented earlier in Tables 50 and 51.

e) Other Socio-economic Characteristics

The average age of a typical farmer is 48 years. More than half of farmers (52%) entered the primary school, 2 percent were degree holders while 18 percent had no schooling at all.

Farming is the major source of income in rural areas. Sixty two percent (62%) of farmers derived their income from agriculture, 6 percent from unskilled work, 5 percent from business, 3 percent from semi-skilled ventures and 24 percent from other sources.

Before the existence of ADCR, rice production programs had already been implemented in the province. However, only 7 percent were included in such endeavors. Nevertheless, 88 percent were extended with personalized service, 12 percent were able to procure certified seeds at subsidized cost, 27 percent obtained fertilizer at subsidized rate and 41 percent availed of free agricultural chemicals.

Table 47. OTHER SOCIO-ECONOMIC CHARACTERISTICS RELATED TO RICE PRODUCTION RIZAL PROVINCE. 1967.

Characteristics	Number	Percent
1. Average Age (years)	48	
2. Educational Attainment		
None	62	18
Primary	173	52
Intermediate	67	20
High School	27	8
College	6	2
	335	100
3. Primary Source of Income		
Farming	209	62
Semi-skilled	9	3
Business	18	5
Unskilled	19	6
Others	80	24
	335	100
4. Inclusion in Previous Rice Production Programs		
Included	25	7
Not Included	310	93
	335	100
5. Assistance Extended Before Formation of ADCR		
a) Personalized service	294	88
None	41	12
	335	100
b) Certified seeds at subsidized cost	40	12
None	295	88
	335	100
c) Free agricultural chemicals	139	41
None	136	59
	335	100
d) Fertilizer at ubsidized cost	92	27
None	243	73
	335	100

5.3. Costs and Returns

The main concern of any rice production program is to increase the levels of productivity which will subsequently increase the income derived from farming. This section on costs and returns is very important to a number of people but most particularly to rice farmers. It is used as a basis of supply dealers in the distribution of production inputs, administrators and policy-makers in the implementation of rice programs and to some extent of politicians in wooing for votes. There are a number of measuring income but for purposes of this review, we will only be concerned about cash costs like seeds, fertilizers and chemicals; and the other one will be non-cash costs or family labor but includes hired labor. The latter is also called variable costs minus the hired labor or those which vary with the quantity of production. The measure which will include full cost of production (including irrigation fee and land tax) will be discussed elsewhere.

Two types of income will be computed: (a) cash receipts from rice produced minus cash expenses for seeds, fertilizers and chemicals; and (b) cash receipts from rice produced minus cash expenses for seeds, fertilizers, chemicals and hired labor including non-cash cost of family labor. For simplicity sake, we will refer cash income to (a) and farm labor income to (b).

For more details, please refer to Tables 47 to 49

5.3.1. Regular Season, 1966

In the regular season of 1966 where only 48 farmers planted IR8, the average cash income realized by a farmer was ₱2,613. It cost him ₱390 per hectare for expenses incurred in seeds, fertilizer and chemicals to produce 117 cavans. A cavan of palay was sold to ADCR at ₱25 and this would mean a receipt of ₱2,934. The highest income per hectare was obtained by Julian Manahan giving him ₱5130 with only ₱450 for cash expenses. Aside receipts from the sale of the produced, he also won a Kubota hand tractor which cost around ₱7,000 for abtaining the highest yield. The lowest income on a hectare basis was obtained by Pablo Jimenez with only ₱1,227 and with a cash expense of ₱178. This drop in productivity (only 57 cavans per hectare) was mainly attributed to the typhoon causing the farm to be flooded when the crop was about to be harvested. But inspite of this calamity, ADCR paid back an amount equivalent to 23 cavans because the contract stated that ADCR guaranteed his yield to be not lower than 80 cavans.

The cash expenses in the above computation included the amount used for buying seeds, fertilizer, chemicals and minor farm equipments like sprayer and rotary weeder which

c) *Production supply distribution plays a major role in increasing productivity of rice farms.*

Institutions engaged in the manufacture and distribution of fertilizers and chemicals should provide a cheap and modest price for their products in order that farmers can apply these inputs at a maximum level. Farmers have experienced that with the use of these inputs, their production was increased subsequently and thus, realized a bigger income on their part. The use of more production inputs are requisites of the new high yielding varieties. Technological changes are characterized by the estansive use of production inputs.

To meet production requirements of rice farms, there must be available farm supply dealers in each municipality. Farmers will not be bothered to get them from Manila or a distance place which will entail additional cost due to transportation. Because of its proximity, farmers initiative to use more production inputs can be increased besides, lower cost is involved. Since competition will be inherent among daelers in the area, farmers will get chance of securing the best price for the products he wants since availability of products is not confined to only one area.

d) Farmers are taught with the proper use of credit and use of savings for capital formation.

With the use of farm plan and farm budget that ADCR implemented in the province, farmers were able to understand the ideal amount of production inputs required in rice production. Farmers were taught that capital should be formed in order to avail to inputs which will increase agricultural productivity. Because of increased productivity, loans obtained can be repaid and savings can be started which will subsequently become the nucleus of their capital for agricultural production.

e) More potential water sources for irrigation rice-should be developed to increase irrigated areas.

The most vital ingredient in rice production is irrigation. To be able to effect the use of production inputs, irrigation water necessitates the efficient utilization of fertilizer and chemicals by the rice plant other than its role as a growth factor. Because of its importance, all possible water sources for crop production should be surveyed and studied as feasible sites of irrigation dams or pump systems. Although a large sum of money will be needed, constructed irrigation systems will ultimately irrigate a vast portion of land which will harness agricultural productivity.

f) Cooperative development should be encouraged among farmers association.

Cooperative, if fully developed among farmers association can eventually manage the marketing of agricultural products. There will be no more place for middlemen who dictates prices but instead farmers will learn to know more of agri-business.

g) A good variety must be fully complemented with all the technological inputs required in production.

It is not necessary that only a good variety should be changed to increase rice productivity but it must be complemented with all the technological inputs. Irrigation should be provided in order that fertilizer and chemicals can become effective in the care and management of the rice crop. Credit should be available to farmers so that there will be capital to be used in buying seeds, fertilizers, chemicals or farm implements or equipments needed in crop production.

Table 47. CASH RECEIPTS, CASH EXPENSES AND CASH INCOME OF FARMERS PLANTING IR8 VARIETY. RIZAL. REGULAR SEASON, 1966.

	Farmers	Cash Receipts*	Cash Expenses **	Cash Income
			= pesos =	
1.	Ceperiano Bleza	2867	359	2508
2.	Apolonio Gatlabayan	3128	630	2498
3.	Julio Gatlabayan	2743	368	2372
4.	Candido Leyva	3388	320	3068
5.	Leon Geronimo	3146	454	2691
6.	Aniano Tesoro	2664	374	2290
7.	Apolinar Anore	3306	331	2975
8.	Nicasio Bucayon	3326	293	3033
9.	Alipio de Leon	3361	323	3038
10.	Tomas Balajadia	2031	285	1746
11.	Zosimo Aranda	1731	317	1414
12.	Eliseo de Guzman	-	-	3837
13.	Melencio Silvestre	1725	301	1426
14.	Julian Manahan	5581	450	5130
15.	Felipe Santos	2811	306	2505
16.	Quirino Balajadia	3364	317	3047
17.	Conrado Buenaventura	2777	270	2507
18.	Simplicio Castillo	2597	417	2180
19.	Julio Inguito	3138	472	2666
20.	Petronilo Fernando	2279	390	1889
21.	MAximo JAvier	3258	572	2686
22.	Guido de Jesus	3321	656	2665
23.	Morong High School	2375	465	1911
24.	Pedro Aman	3051	454	2599
25.	Marcelino Arandia	3228	337	2891
26.	Rogelio Unira	2992	278	2714
27.	Antonio Velasco	3334	444	2889
28.	Delfin Bukalan	2542	254	2289
29.	Domiciano Cruz	3758	303	3336
30.	PAblo Jimenez	1405	178	1227
31.	Gregorio Alejan	2595	452	2143
32.	Jose de Leon	2176	336	1840
33.	Manuel Licudan	1668	395	1272
34.	Jose Adona	2852	484	2368
35.	Aurelio Manahan	5342	309	5033
36.	Pedro Valerio	3376	238	3138
37.	Marcelo Capistrano	3053	432	2621
38.	Felix Santos	2747	564	4203
39.	Benedicto Felix	2668	540	2128
40.	Leoncio Amonoy	2873	398	2475

Table 47. continued . . .

41.	Serafin Benavidez	3489	302	3187
42.	Dominador Capistrano	2782	344	2438
43.	Santos Catolos	2625	322	2303
44.	Manuel Tanjuatco	3565	405	3167
45.	Aquilino dela Cruz	1903	437	1466
46.	Gregorio Vallesteros	3441	413	3028
47.	Gregorio de Leon	3167	551	2618
48.	Ponciano de Leon	2335	469	1866
	RIZAL	2934	390	2544

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* Computed at ₱18.00 per cavan.
** Includes cost of seeds, fertilizers and chemicals only.

averaged to ₱30 each. Also included was the interest rate of one percent per month because the above expenses were obtained through loans from rural banks.

5.3.2. Palagad Season, 1967

The methods of computing for costs and returns were made. This time, however, data were presented by municipality. Cash income and family labor income was derived. Also, a comparison was made between costs and returns of planting IR8 and ordinary varieties. The data are presented in Table 48 .

Farms planted with IR8 variety gave an average cash income of ₱1,939. The cash receipts was estimated to be ₱2,181 and cash expenses of ₱241. Cash expenses ranged from ₱30 to as high as ₱286 per hectare and cash receipts ranged from ₱1,134 to as high as ₱3,564 computed at ₱18 per cavan. The highest average cash income was derived by farmers from Morong and the lowest returns by farmers from Antipolo which was only ₱970 per hectare.

In case of farmers planting ordinary varieties, the cash income realized was ₱1,084. The average productivity was 63 cavans per hectare and sold at ₱16 a cavan gave a receipt of ₱1,130 but only ₱52 was incurred for buying seeds, fertilizer and chemicals. This very low figure for cash expenses indicated that fertilizer and chemical use is at its minimum as compared to the recommended cultural practices.

Table 48a. CASH RECEIPTS, CASH EXPENSES AND CASH INCOME OF FARMERS PLANTING IR8 VARIETY. RIZAL. PALAGAD SEASON, 1967.

	Municipality	Cash Receipts*	Cash Expenses**	Cash Income
		=pesos=		
1.	Angono	3564	315	3249
2.	Baras	2412	231	2181
3.	Binangonan	3222	285	2937
4.	Cainta	-	-	-
5.	Cardona	2888	363	2525
6.	Jalajala	1638	201	1437
7.	Montalban	2682	300	2382
8.	Morong	1368	199	1169
9.	Pililla	2574	222	2352
10.	San Mateo	2070	259	1811
11.	Taguig	2070	251	1819
12.	Tanay	3114	369	2745
13.	Taytay	3420	386	3034
14.	Teresa	1584	115	1469
15.	Antipolo	1134	164	970
16.	Las Pinas	-	-	-
17.	MArikina	2286	42	2244
18.	Munitnglupa	1764	228	1536
19.	Pasig	2790	30	2760
20.	Pateros	-	-	-
	RIZAL	2181	242	1939

* Computed at ₱18.00 per cavan.
** Includes cost of seeds, fertilizer and chemicals only.

Table 48b. CASH RECEIPTS, CASH EXPENSES AND CASH INCOME OF FARMERS PLANTING ORDINARY VARIETIES. RIZAL. PALAGAD SEASON, 1967

Municipality	Cash Receipts*	Cash Expenses**	Cash Income
1. Angono	-	-	-
2. Baras	990	90	960
3. Binangonan	1044	70	974
4. Cainta	-	-	-
5. Cardona	1674	86	1588
6. Jalajala	-	-	-
7. Montalban	936	114	822
8. Morong	1512	51	1461
9. Pililla	864	21	843
10. San Mateo	1548	79	1469
11. Taguig	1116	39	1077
12. Tanay	918	24	894
13. Taytay	702	36	666
14. Teresa	-	-	-
15. Antipolo	-	-	-
16. Las Pinas	-	-	-
17. Marikina	-	-	-
18. Muntinglupa	774	40	734
19. Pasig	1422	58	1364
20. Pateros	-	-	-
RIZAL	1136	52	1084

* Computed at ₱18.00 per cavan.
** Includes labor expenses.

The method by which other than the above expenses were included, gave an average IR8 farmer a farm labor income of ₱1,349. The additional expenses involved was ₱589 or a total of ₱831. In the case of farmers planting other varieties, the additional expenses involved was ₱287 and giving only a farm labor income of ₱797. This method does not include items on depreciation of farm implements, land rent and irrigation fee.

Before the ADCR came in, only ₱36 was used for seeds, fertilizers and chemicals and this amount increased a bit in 1967 to ₱52. Because IR8 will require a more intensive culture than ordinary varieties, an amount of ₱489 was the total cost for expenses other than seeds, fertilizer and chemicals as compared to only ₱287. Nevertheless, by planting IR8 variety, farmers in Rizal realized an income of ₱854 more as compared to planting ordinary varieties.

Table 48o. CASH RECEIPTS, FARM EXPENSES AND FARM LABOR INCOME OF FARMERS PLANTING IR8 VARIETY. RIZAL PROVINCE. PALAGAD SEASON, 1967.

	Municipality	Cash Receipts	Farm Expenses	Farm labor Income
1.	Angono	₱3,564	₱1,026	₱2,538
2.	Baras	2,412	1,067	1,345
3.	Binangonan	3,222	815	2,406
4.	Cainta	-	-	-
5.	Cardona	2,888	955	1,925
6.	Jalajala	1,638	599	1,039
7.	Montalban	2,682	967	1,715
8.	Morong	1,368	606	762
9.	Pililla	2,574	993	1,581
10.	San Mateo	2,070	823	1,247
11.	Tagig	2,070	833	1,237
12.	Tanay	3,114	1,300	1,814
13.	Taytay	3,420	1,427	1,993
14.	Teresa	1,584	317	1,267
15.	Antipolo	1,134	502	632
16.	Las Pinas	-	-	-
17.	Marikina	2,286	200	2,086
18.	Muntinglupa	1,764	688	1,076
19.	Pasig	2,790	797	1,993
20.	Pateros	-	-	-
	RIZAL	₱2,181	₱831	₱1,349

Table 48d. CASH RECEIPTS, FARM EXPENSES, FARM LABOR INCOME OF FARMERS PLANTING ORDINARY VARIETIES. RIZAL PROVINCE. PALAGAD SEASON, 1967.

	Municipality	Cash Receipts*	Farm Expenses	Farm Labor Income
1.	Angono	-	-	-
2.	Baras	₱ 990	₱392	₱ 598
3.	Binangonan	1,044	272	772
4.	Cainta	-	-	-
5.	Cardona	1,674	325	1,349
6.	Jalajala	-	-	-
7.	Montalban	936	327	609
8.	Morong	1,512	489	1,023
9.	Pililla	864	352	512
10.	San Mateo	1,548	324	1,244
11.	Tagig	1,116	308	808
12.	Tanay	918	177	741
13.	Taytay	702	277	424
14.	Teresa	-	-	-
15.	Antipolo	-	-	-
16.	Las Pinas	-	-	-
17.	Marikina	-	-	-
18.	Muntinglupa	774	276	498
19.	Pasig	1,422	4[illegible]2	1,020
20.	Pateros	-	-	-
	RIZAL	₱1,136	₱ 339	797

* Computed at ₱18.00 per cavan.

5.3.3. Regular Season, 1967

For the reason that productivity declined in the regular season of 1967, the cash receipts of farmers decreased proportionately, much more that price per cavan falled off by ₱2. Nevertheless, although this deficiency occurred, it was also experienced by almost all farmers in Rizal and even in other provinces.

Farmers who planted IR8 and other high yielding varieties were able to realize a cash income of ₱1,101 from a receipt of ₱1,193 and spending ₱92 for cash expenses. There was an additional of ₱55 for farm expenses. It will be noted that with only ₱92 for cash expenses, 25 percent will already be spent for seeds and the others are spent for 2 or 3 bags of fertilizer and a bottle of pesticide or weedicide. This does not mean, however, that farmers are reluctant to use these inputs but they wanted to use the minimum dosage for their crops. Planting ordinary varieties cost the farmer ₱48 for cash expenses as compared to ₱36 in 1966. The difference of ₱12 may imply that an additional of one bag ammonium sulfate was bought by the farmer for his rice crop. An additional of ₱73 was used for farm labor expenses. Consequently, farmers received ₱1,103 for their produced which gave him a farm labor income of ₱892 while if only cash expenses were deducted, it will give him ₱965 as cash income.

Table 49a. CASH RECEIPTS, CASH EXPENSES AND CASH INCOME OF FARMERS PLANTING HIGH YIELDING VARIETIES* . RIZAL PROVINCE. REGULAR SEASON, 1967.

Municipality	Cash Receipts**	Cash Expenses	Cash Income
1. Angoño	₱ 1,872	110	₱ 1,762
2. Baras	608	111	497
3. Binangonan	1,280	103	1,177
4. Cainta	1,168	121	1,047
5. Cardona	1,952	200	1,752
6. Jalajala	1,360	68	1,292
7. Montalban	1,312	112	1,200
8. Morong	1,008	72	936
9. Pililla	1,360	112	1,248
10. San Mateo	864	107	757
11. Tagig	768	50	715
12. Tanay	848	71	777
13. Taytay	1,680	152	1,528
14. Teresa	864	112	752
15. Antipolo	768	60	708
16. Las Pinas	2,064	74	1,990
17. Marikina	816	39	777
18. Muntinglupa	1,120	47	1,073
19. Pasig	-	-	-
20. Pateros	960	34	926
RIZAL	₱ 1,193	₱ 92	₱ 1,101

* Includes C4, IR8, IR5 and BPI-76.

** Computed at ₱16.00 per cavan.

Table 49b. CASH RECEIPTS, CASH EXPENSES AND CASH INCOME OF FARMERS PLANTING ORDINARY VARIETIES. RIZAL PROVINCE. REGULAR SEASON, 1967.

Municipality	Cash Receipts *	Cash Expenses	Cash Income
1. Angono	₱ 1,120	₱ 37	₱ 1,083
2. Baras	1,420	203	1,217
3. Binangonan	1,008	52	956
4. Cainta	880	19	861
5. Cardona	1,040	59	981
6. Jalajala	800	26	774
7. Montalban	896	18	876
8. Morong	992	73	919
9. Pililla	976	40	936
10. San Mateo	992	35	957
11. Tagig	800	21	779
12. Tanay	1,184	48	1,136
13. Taytay	1,072	25	1,047
14. Teresa	816	74	742
15. Antipolo	1,152	37	1,115
16. Las Pinas	960	27	933
17. Marikina	1,056	27	1,029
18. Muntinglupa	976	51	925
19. Pasig	672	31	641
20. Pateros	1,456	48	1,408
RIZAL	₱ 1,013	₱ 48	₱ 965

* Computed at ₱16.00 per cavan.

Table 49c. CASH RECEIPTS, FARM EXPENSES AND FARM LABOR INCOME OF FARMERS PLANTING HIGH YIELDING VARIETIES.* RIZAL. REGULAR SEASON, 1967.

Municipality		Cash Receipts**	Farm Expenses	Farm Labor Income
1.	Angono	₱ 1,872	₱ 343	₱ 1,529
2.	Baras	608	88	520
3.	Binangonan	1,280	69	1,211
4.	Cainta	1,168	43	1,125
5.	Cardona	1,952	160	1,792
6.	Jalajala	1,360	206	1,154
7.	Montalban	1,312	67	1,245
8.	Morong	1,008	157	851
9.	Pililla	1,360	203	1,157
10.	San Mateo	864	74	790
11.	Tagig	768	63	705
12.	Tanay	848	187	661
13.	Taytay	1,680	126	1,554
14.	Teresa	864	78	786
15.	Antipolo	768	72	696
16.	Las Pinas	2,064	299	1,765
17.	Marikina	816	116	700
18.	Muntinglupa	1,120	246	874
19.	Pasig	-	-	-
20.	Pateros	960	198	762
	RIZAL	₱ 1,193	₱ 147	₱ 1,046

* Includes C4-63, IR5, IR8 and BPI-76.
** Computed at ₱16.00 per cavan.

Table 49d. CASH RECEIPTS, FARM EXPENSES, FARM LABOR INCOME OF FARMERS PLANTING ORDINARY VARIETIES. RIZAL PROVINCE. REGULAR SEASON, 1967.

Municipality	Cash Receipts *	Farm Expenses	Farm Labor Income
1. Angono	₱ 1,120	₱ 259	₱ 861
2. Baras	1,420	69	1,351
3. Binangonan	1,008	104	904
4. Cainta	880	33	847
5. Cardona	1,040	221	819
6. Jalajala	800	216	595
7. Montalban	896	67	829
8. Morong	992	121	871
9. Pililla	976	123	853
10. San Mateo	992	94	898
11. Tagig	800	175	625
12. Tanay	1,184	132	1,052
13. Taytay	1,072	131	941
14. Teresa	816	139	677
15. Antipolo	1,152	44	1,108
16. Las Pinas	960	99	861
17. Marikina	1,056	57	999
18. Muntinglupa	976	69	907
19. Pasig	672	63	609
20. Pateros	1,456	212	1,244
RIZAL	₱ 1,013	₱ 121	₱ 892

* Computed at ₱16.00 per cavan.

5.4. *Agricultural Development Fund*

One of the most outstanding feature of the ADCR program is the provision of capital to farmers for crop production and the financing of developmental facilities. The said amount shall be advanced by the province of Rizal. And because of this plan of development, the Provincial Government of Rizal and the Rizal Federation of Rural Banks had entered into an agreement whereby the province shall establish an Agricultural Development Fund. The release of such funds shall be coursed through the rural banking system of the province.

Sometime in September 1966, this agreement was signed by participating banks and the province of Rizal. On December 20, 1966, the first initial deposit of ₱1,000,000 as special savings account with the Philippine NAtional Bank was executed in the name of the Agricultural Development Council for Rizal and in behalf of the province. Under this Agreement, the maximum amount to be deposited shall be ₱5,000,000. Aside from the initial deposit, an amount of ₱478,660 was also deposited as current accounts.

The procedure of fund transfer is described as follows: ADCR prepares a check in favor of the requesting rural bank which is covered by the amount deposited in the PNB and in turn the rural bank withdraws either from the PNB or through *the depository bank of the rural bank concerned with proper clearing from the PNB. The first fund tranfer of the ADCR was made on January 10, 1967 with the Morong Rural Bank in the amount of ₱36,000 as Production Loans (Agreement IV). In case of fund transfer to farmers' association, the first was on March 21, 1967 to San Isidro Farmers Association of Montalban in the amount of ₱170,500 and ₱67,000 to U-ugong Irrigation Association of Morong. The farmers' association deposited said amount to rural bank and the same is withdrawn as expenditures for the construction of irrigation systems are needed. This is covered by Agreement I or funds for the construction of gravity irrigation systems.*

As of July 1, 1968, a total of ₱1,731,209.02 was transfered by the ADCR to rural banks and farmers' association and is itemized as follows:

Gravity irrigation	-	*₱670,959.02*
Pump irrigation	-	*148,800.00*
Farm machineries	-	*350,200.00*
Production	-	*119,250.00*
Commodity	-	*30,000.00*
Commercial	-	*319,000.00*
Total	-	*₱1,731,209.02*

A more detailed discussion of the agricultural financing scheme of the ADCR is given in Appendices 1a to 1h.

Table 50. FUNDS TRANSFERED TO FARMERS ASSOCIATIONS UNDER AGRICULTURAL DEVELOPMENT FUND. RIZAL PROVINCE AS OF JUNE 30, 1968

	Farmer's Association	Gravity Irrigation (Agreement I)
1.	U-ugong Irrigation Association Morong, Rizal	₱100,000.00
2.	San Isidro Farmers Association Montalban, Rizal	170,500.00
3.	Gitnang Bayan Farmers Assn. San Mateo, Rizal	45,195.00
4.	Irrigation Pump Association Wawa, San Pedro-Morong	32,764.02
5.	Baras Communal Irrigation Assn. Baras, Rizal	108,000.00
6.	San Lorenzo Farmers Association Pililla, Rizal	120,000.00
7.	Matagbac Farmers Association Pililla, Rizal	40,000.00
8.	Buhangin Farmers Association Teresa, Rizal	21,000.00
9.	Jalajala (Samahang Magbubukid) Jalajala, Rizal	15,000.00
10.	Kapisanang MAgsasaka ng San Juan Morong, Rizal	18,500.00
11.	San Isidro (Niogan) Farmers Association, Pililla, Rizal	33,000.00
12.	Wawa Farmers Association Tanay, Rizal	30,000.00
13.	Ilaya (Salang Bata) Farmers Assn. Tanay, Rizal	30,000.00
	TOTAL	₱763,959.02

Table 51. FUNDS TRANSFERED TO RURAL BANKS UNDER AGRICULTURAL DEVELOPMENT FUND. RIZAL. AS OF JUNE 30, 1968.

	Participating Rural Bank	Pump Irrigatn. Agree.II	Farm Mechanizatn. Agree. II	Productn. Agree.IV	Commodity Agree.VI	Commercial Article X Agree. V Gen. Memo	Total
1.	Morong Rural Bank	₱55,200	₱ 70,000	₱10,000	₱15,000		₱156,200
2.	Tanay Rural Bank		50,000	34,000		₱60,000	144,000
3.	Antipolo Rural Bank	4,000	14,000	12,000	15,000		45,000
4.	Angono Rural Bank			9,600			9,600
5.	Pateros Rural Bank	16,000	34,000	3,600			53,600
6.	Marikina Rural Bank	11,000	9,600	4,800			25,400
7.	Taytay Rural Bank		21,800			159,000	180,800
8.	Mandaluyong Rural Bank		8,400				8,400
9.	Pililla Rural Bank	50,000	15,000	16,000			81,000
10.	Taguig Rural Bank		119,000	3,600			122,600
11.	Montalban Rural Bank	6,600	8,400	13,650			28,650
12.	Binangonan Rural Bank			1,200			1,200
13.	Teresa Rural Bank			4,800			4,800
14.	Cainta Rural Bank	6,000				100,000	106,000
	TOTAL	₱148,800	₱550,200	₱119,250	₱30,000	₱319,000	₱967,250

5.5. Irrigation Development

5.5.1. Gravity Irrigation

As of July 1, 1968, there were 68 project sites for gravity irrigation that were investigated. Of these, 41 sites were already surveyed covering a potential area of 4,915 hectares. There were 7 irrigation systems already constructed under the ADCR program with a total potential area of 970 hectares. These irrigation systems cost the ADCR an amount of ₱303,319.

There are 4 irrigation systems under construction which will irrigate a potential area of around 740 hectares and will cost the ADCR ₱411,500. On the average, these four irrigation projects are 57 percent accomplished. Only one irrigation project has just been started. There are 2 more irrigation projects slated for construction. These two projects have a potential area of 405 hectares with an appropriation of ₱126,500.

With the construction of all the above projects, it will sum up to 2,115 hectares as potential irrigable area that can be served by the gravity irrigation system. The above projects will, however, cost the ADCR ₱841,319 or approximately ₱398 per hectare.

Figures indicated by the 1960 Census of Agriculture showed that the province has 1,349 hectares irrigated by

Table 52. IRRIGATION SYSTEM CONSTRUCTED UNDER THE ADCR PROGRAM. RIZAL. JULY, 1968.

	Irrigation System	Cost (₱)	Potential Area (ha.)
1.	Sta. Rosa Irrigation System Teresa, Rizal	₱ 34,360.00	200 has.
2.	Matagbak Irrigation System Pililla, Rizal	40,000.00	100
3.	San Lorenzo Irrigation System Pililla, Rizal	120,000.00	230
4.	Abu-ab Irrigation System San Mateo, Rizal	45,195.00	200
5.	Wawa Irrigation System San Juan, Morong, Rizal	18,500.00	100
6.	Macabling Irrigation System Teresa, Rizal	21,000.00	70
7.	Wawa Irrigation System San Pedro, Morong, Rizal	24,264.00	70
	TOTAL	₱303,319.00	970 has.

Table 53a. IRRIGATION SYSTEM UNDER CONSTRUCTION UNDER THE ADCR PROGRAM. RIZAL. JULY, 1968.

Name	Appropriation (₱)	Potential Area (ha)	Per Cent of Accomplishment
1. Baras Communal Irrig. Project, Baras, Rizal	₱108,000.00	120	66
2. U-Ugong Irrig. Proj. Morong, Rizal	100,000.00	300	76
3. Pakiing River Irrig. Proj, Montalban, Rizal	170,500.00	250	86
4. Batlag Irrig. Proj. Niogan, Pililla, Rizal	33,000.00	70	Nil
TOTAL	₱411,500.00	740	57

Table 53b. IRRIGATION SYSTEM SLATED FOR CONSTRUCTION UNDER THE ADCR PROGRAM. RIZAL. JULY, 1968.

Name	Appropriation (₱)	Potential Area (ha.)
1. Salang Bata Irrigation Project Tanay, Rizal	₱ 73,500.00	205
2. Wawa Irrigation Project Tanay, Rizal	53,000.00	200
TOTAL	₱ 126,500.00	405

gravity system and this area can be made than doubled by the end of 1968. This of course, excludes the area irrigated by pump irrigation system. Based on the experience of irrigation engineers, it is however, estimated that only 80% of potential irrigable area can be served by the system during the wet season and 30% during the dry season. This would only be around 1692 and 634 hectares, respectively by season. Although the system serves the farms within the area, the problem of constructing more lateral canals becomes a problem for efficient utilization. Many landowners do not like to give right of way for the construction of canals.

5.5.2. Pump Irrigation

In case of pump irrigation system, considerable increase was made with the implementation of the ADCR program together with current ISU projects in the province. As of July 1, 1968, there are already 81 farmer-recipients of the ADCR's pump irrigation program which was either communal or privately owned. The total irrigable area was 728 hectares with around 625 farmers being served. The average size of pump was 6 inches with average engine rating of 21 horsepower. The total cost of the pumps intalled through ADCR was ₱299,891.60 or approximately ₱37,500.00 each.

Moreover, although ADCR is setting-up pumps through its agricultural program, installation through ISU is also being continued in the province. As of July 1, 1968, a total of 67 farmers were recipients of ISU pumps. The total irrigable area was estimated to be 1968. The average size of a pump installed in the province was 6.3 inches.

In 1960, it was reported that only 534 hectares were being served by pump irrigation system. At present, this area was increased to almost 5 times. With the construction of more pump irrigation system in the province, a total of 2,738 hectares were added. Of this total, however, irrigation engineers feel that only 80 percent is effective during the wet season and 40-60 percent during the dry season.

Table 56. PUMP IRRIGATION PROJECTS OF ADCR. RIZAL. JULY 1, 1968

Municipality	No. of Recipients	Irrig. Area	Farmers Served	Ave. Size of Pump	Engine H.P.	Total Cost
1. Binangonan	4	140	115	6.0	17.9	₱ 40,800.00
2. Cainta	3	22	19	3.3	5.5	7,366.00
3. Jalajala	4	39	32	3.5	5.7	15,000.00
4. Morong	7	123	121	4.4	9.5	32,216.00
5. Montalban	1	50	20	8.0	26.0	16,500.00
6. Pililla	8	276	243	6.6	19.0	110,950.60
7. San Mateo	1	40	40	8.0	26.0	13,000.00
8. Tagig	2	20	10	10.0	10.0	6,408.00
RIZAL	30	710	600	6.2	15.0	₱ 242,240.60

Table 57. NUMBER OF RECIPIENTS, IRRIGABLE AREA
IN HECTARES AND AVERAGE SIZE OF PUMP,
BY MUNICIPALITY. ISU, RIZAL.
JULY 1, 1968.

	Municipality	No. of Recipient	Irrigation Area	Ave. Size of Pump
1.	Angono	2	78	7.0
2.	Antipolo	1	8	4.0
3.	Baras	4	179	8.5
4.	Binangonan	16	433	5.9
5.	Cardona	3	80	6.0
6.	Jalajala	2	65	6.5
7.	Montalban	4	53	4.2
8.	Morong	12	45.5	7.0
9.	Munitnglupa	1	10	4.0
10.	Pasig	1	85	8.2
11.	Pililla	5	62	4.4
12.	San Mateo	3	80	6.3
13.	Tagig	3	35	5.6
14.	Tanay	3	150	8.0
15.	Taytay	2	135	9.0
16.	Teresa	1	30	6.0
17.	Quezon City	1	30	6.0
	TOTAL	67	1,968	6.3

5.6. Farm Machinery

The program on farm machinery[a/] was started in October 1966 and to-date application received numbered 118. As originally conceived by the ADCR, a tractor of around 5 horsepower each shall be made available to every 100 hectares in the province and therefore, Rizal under the program would have at least 100 tractor units.

There are a total of 81 applications for tractors endorsed by ADCR to rural banks that were approved. This number will exclude tractors released through the CB-IBRD program. There were 30 tractors released under the CB-IBRD program. The total number of horsepower released through the ADCR program was 1,207 or approximately 15 horsepower each tractor. The total amount of ADCR participation was ₱269,615.20 which is equivalent to 40 percent of total cost of tractors. The other 60 percent was shouldered by the rural bank concerned and the total amount released through the ADCR program amounted to ₱673,415.38.

In Table 58. is presented the estimated number and horsepower rating required for each municipality based on the farm area of the locality. The table also shows the existing number and horsepower of tractors by municipality. Because it

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[a/] Farm machinery is referred only to power tillers or commonly called as hand tractors and the ordinary 4-wheel tractors.

Table 58. ESTIMATED AND EXISTING NUMBER AND HORSEPOWER RATINGS OF TRACTORS, BY CONTIGUOUS AREA. RIZAL. JULY, 1968

Municipality		Farm Area (ha)	Estimated * Tractors		Existing ** Tractors		Tractor Difference	
			No.	H.P.	No.	H.P.	No.	H.P.
A.	Montalban	405	4	20	2	17	2	3
	San Mateo	554	6	30	-	-	6	30
		959	10	50	2	17	8	33
B.	Marikina	420	4	20	2	17	2	3
	Pasig	697	7	35	-	-	7	35
		1117	11	55	2	17	8	38
C.	Pateros	39	1	5	2	75	(1)	(70)
	Tagig	1,051	11	55	13	652	(2)	(597)
		1,081	12	60	15	727	(3)	(667)
D.	Jalajala	469	5	25	-	-	5	25
	Pililla	516	5	25	4	32	1	(7)
		985	10	50	4	32	6	18
E.	Tanay	2,146	21	105	25	157	4	(52)
	Baras	74	1	5	-	-	1	-
		2,220	22	110	25	157	3	(52)
F.	Morong	1,992	20	100	45	347	(25)	(247)
G.	Cardona	38	1	5	-	-	1	5
	Binangonan	596	6	30	1	7	5	23
		634	7	35	1	7	6	28
H.	Angono	146	1	5	-	-	1	5
	Taytay	114	1	5	8	84	(7)	(79)
	Cainta	336	3	15	-	-	3	15
		569	5	25	8	84	(3)	59
I.	Teresa	422	4	20	-	-	4	20
	Antipolo	500	5	25	9	67	(4)	(42)
		922	9	45	9	67	0	22
J.	Las Pinas	1,108	11	55	-	-	11	55
	Munitinglupa	632	6	30	-	-	6	30
		1,740	17	85	-	-	17	85
	RIZAL	12,254	123	615	111	1,455	12	(845)

* Based on 1 tractor of 5 H.P. each for every 100 hectares.
**As recorded by rural banks: ADCR and CB-IBRD program continued.

NOTE: Figures in parenthesis are positive differences.

is assumed that a tractor in a locality could radiate easily to a nearby area and places where tractors are not available, the distribution of tractors were based according to contiguinity of areas. It will be noted that existing tractors presented in the table were only those acquired through credit facilities of the ADCR and the national CB-IBRD program. The table does not indicate tractors acquired without any credit assistance. An example is the tractor given as a prize by the ADCR to the winner of the 1966 Seed Production Contest. In Pasig, it had been observed that some landowners owned big tractors and this situation may be true to other municipalities.

In two years of existence of the ADCR, 111 tractors were already made available in the province. There are still numerous applications being received. Of the estimated number of tractors which is 123, only 12 more tractors will be needed. But, horsepowerwise, the province has already an excess of 845 horsepower as compared to the required 615.

At this juncture, it can be said that the province of Rizal has already reached the stage whereby farm power with the use of tractors gradually replaced farm animals in land preparation and eventually the human power in harvesting and threshing operations. Human energy are supplemented with mechanical weeder and power sprayer in the care of rice plants.

Table 59. TRACTORS RELEASED THROUGH ADCR AND CB-IBRD FINANCING PROGRAM, BY HORSEPOWER AND BY TRACTOR BRAND. RIZAL. AS OF JUNE 30, 1968.

	Tractor Brand	4-6 HP	7-15 HP	Above 15 HP	Total
1.	Honda		39		39
2.	Kubota	1	19		20
3.	Iseki	5	8		13
4.	Hinomoto	6	5		11
5.	Mitsubishi		6		6
6.	Ford			6	6
7.	John Deere			4	4
8.	Yanmar	1	2		3
9.	Fuji		3		3
10.	Holden			1	1
11.	Daikin		1		1
12.	Massey-Ferguson			1	1
13.	Hanomag			1	1
14.	Yamaha		1		1
15.	Ransomes			1	1
	Total	13	84	14	111

5.7. Cooperative Development

The Cooperative Group was created in order to implement the following objectives: (a) to develop among farmers the wise use of credit, (b) to develop among farmers a more desirable attitude towards cooperation, and (c) to show farmers the social and economic advantages working through cooperation among themselves.

5.7.1. Training Conducted

So far, five (5) formal seminars were conducted for farmers and government workers. These are for:

a. 22 PACD workers - November 28 and 29, 1966.

b. 11 Farmers' Association (151 Farmers) December 1 to 15, 1966.

c. 207 Farmers - JAnuary 10-25, 1967.

d. PACD workers (follow-up course) - May 29 to 31, 1967.

e. 39 FMTs - January to March 1968.

Aside from the formal training courses, tutorials were conducted to members of associations which are being converted into cooperatives. These tutorials average 16 hours per farmers' association, mainly on such subjects as rights and obligations of members and officers, operation and management of the cooperative. These tutorials also serve as open forums where a dialogue between speakers and the audience is encouraged.

5.7.2. Cooperatives Organized and Registered

As of June 30, 1968, there were six cooperatives fully organized while three have been actually registered with the Securities and Exchange Commission and affiliated with the Agricultural Credit Administration. It is expected that the other three will likewise be registered and affiliated about the end of this month (July).

With an aggregated authorized capital of ₱391,000.00 and paid-up capital of ₱23,195.00, these six cooperatives are classified by type as follows: service (Irrigation) - 4 specialized (duck-raising) - 1, marketing - 1.

5.7.3. Proposed Farmers Irrigation Cooperatives

Aside from those already fully organized and registered, there are nine (9) other farmers' associations which have been organized into irrigation cooperatives. These associations count with the total membership of 748 farmers.

For these associations, the education and organizational phases have been completed. However, the papers are still under process. A few are still in the stage of filling up their required paid-up capital.

It is expected that all the above nine associations will be registered as irrigation cooperatives by the end of 1968.

5.7.4. Summary of Development

It will be noted that during the two years under review, the whole of the first year was practically devoted to education and information activities. This was so programmed in order to provide a solid membership base on cooperatives. The second year was devoted mainly on organization.

Education and information, however, do not end upon organization and registration of the cooperative. Tutorials are conducted on a continuing basis even when the cooperative is already operational. Seminars are also programmed for specific office bearers of cooperatives. As part of supervision, ADCR fieldmen attend monthly board meetings of the different cooperative as well as their annual meetings. If need be, special members' meeting are called to thresh out problems that may be solved only by membership action.

In its third year, the ADCR feels that it is heading towards the right direction in pursuing activities which implement a cooperative development plan that is integrated with the over-all ADCR Program.

Proposed activities for the third year include guidance on management, [illegible] collection drive, organization of a provincial cooperative union and, of course, a sustained and continuing information and education program.

Table 60. SEMINARS CONDUCTED BY THE COOPERATIVE GROUP. ADCR. NOVEMBER 1966 TO MARCH 1968.

Seminars	First Seminar	Second Seminar		Third Seminar		4th Coop. Refresher Course	5th Coop. Seminar
		Ass'n Represented	No. of Participants	Ass'n Represented	No. of Participants		
A. Farmers							
1. Education	-	9	28	11	37	-	-
2. Project	-	10	26	12	41	-	-
3. Finance	-	11	27	12	36	-	-
4. Contract	-	10	27	14	42	-	-
5. By Laws	-	11	43	11	51	-	-
B. PACD Personnel	22	-	51	-	-	22	-
C. APC Personnel (FMT)	-	-	-	-	-	-	39
TOTAL	22	11	51	14	207	22	39

Table 61. PROPOSED FARMERS' COOPERATIVES: PAPERS UNDER PROCESS. RIZAL. JULY, 1968

	Names of Associations	Membership
1.	Dalaguli Irrigation Coop. Association	61
2.	Niogan Farmers' Irrigation Coop. Association	31
3.	Tanay Wawa Farmers' Coop. Association	67
4.	Salang Bata Irrigation Cooperative Association	92
5.	Baras Irrigators Cooperative Association	274
6.	Caniogan Farmers' Irrigation Coop. Association	50
7.	Buhangin Farmers' Irrigation Coop. Association	53
8.	Pakiing Farmers' Irrigation Coop. Association	86
9.	Abuco (San Mateo) Farmers' Irrigation Coop. Assn.	34
	TOTAL	748

Table 62. COOPERATIVE ASSOCIATIONS ORGANIZED.
RIZAL PROVINCE. FISCAL YEAR 1967-68.

Name of Cooperatives	Date of registration	Registration No.	Membership	Capitalization		
				Authorized	Subscribed	Paid-up
1. Rizal Producers Merketing Coop. Inc., Pasig, Rizal	SEC=Sept. 28/67 ACA-Oct. 2/67	34425 605	109	₱100,000.	₱26,600.	₱5,320
2. Rizal Duck Raiser's Coop. Marketing Assn. Inc., Morong, Rizal	SEC-Oct. 30/67 ACA	33668	40	100,000	20,200	5,055
3. San Francisco Farmers' Coop. Assn. Inc., Wawa, Pililla, Rizal	SEC-Jun. 14/68 ACA-Jun. 19/68	35550	25	20,000.	4,000.	1,120
4. San Lorenzo Farmer's Irrigation Coop. Assn. Inc., Pililla, Rizal	*		67	80,000.	16,750	4,020
5. Wawa-San Pedro Farmer's Irrigation Coop. Assn. Inc., San Pedro, Morong	*		62	25,000.	5,030	2,240
6. U-Ugong Irrigation Dam Coop. Inc., Morong, Rizal	*		140	66,000.	13,200	5,440
		TOTAL	443	₱391,000	₱85,780.	₱23,195

* Papers pending registration with the Securities and exchange Commission.

5.8. Marketing

5.8.1. Supplies and Materials

Marketing functions of the ADCR was started in May, 1967 with the establishment of the Rizal Producers' Marketing Cooperative. RPMC, a farmer-owned cooperative and currently being supervised by the ADCR, handles the market and marketing aspects of agricultural production in the province. With an authorized capital of ₱100,000.00, the RPMC had a substantial growth with respect to its financing for the past four quarters.

As a marketing organization, RPMC procures and sells seeds and agricultural supplies and materials needed in the farm. As of June 30, 1968, 6,367 bags of fertilizer was procured amounting to ₱121,123.20. For chemicals, the amount procured was ₱65,993.87 and ₱76,117 for other supplies composed mostly of jute sacks and ropes. Farm equipments like rotary weeders, sprayers and the like were also procured and amounted to ₱6,880.50.

Because of the launching of the vegetable program in the province, the RPMC purchased seeds worth ₱27,834.11. Aside from the above supplies and materials, RPMC also handles farm machineries. They were the first to acquire Kubota Harvester in the Philippines and the first acquisition was 20 units amounting to ₱147,991.60. They were able to acquire

Table 63. PROCUREMENT OF SUPPLIES AND MATERIALS, RPMC, ADCR. AS OF JUNE 30, 1968.

Supplies and Materials	Quality	Value
Fertilizers		
Jul-Sept '67	907 bags	₱ 16,219.55
Oct-Dec '67	680	12,233.55
Jan-Mar '68	1,835	37,630.35
Apr-Jun '68	2,945	55,039.75
	6,367 bags	₱121,123.20
Chemicals		
Jul-Sept '67		₱ 17,023.08
Oct-Dec '67		32,606.19
Jan-Mar '68		15,810.76
Apr-Jun '68		553.84
		₱ 65,993.87
Other Supplies *		
Jul-Sept '67		₱ 19,450.00
Oct-Dec '67		22,417.21
Jan-Mar '68		18,710.00
Apr-Jun '68		15,540.00
		₱ 76,117.21
Farm Equipment		
Jul-Sept '67		₱ 3,012.88
Oct-Dec '67		3,057.68
Jan-Jun '68		810.00
		₱ 6,880.50
Vegetable Seeds		
Oct-Dec '67		₱ 26,250.00
Jan-Mar '68		630.91
Apr-Jun '68		953.20
		₱ 27,834.11
Farm Machineries		
Oct-Dec '67 (Kubota Harvester)	20 units	₱147,991.60
Jan-Mar '68 (Irrigation Pumps)	7	29,116.20
Apr-Jun '68 (Irrigation Pumps)	2	23,233.50
		₱200,341.30
	Total	₱498,290.19

* Include Jute sacks, ropes, etc.

Table 64. SALES OF SUPPLIES AND MATERIALS.
RPMC, ADCR. AS OF JUNE 30, 1968.

Supplies & Materials	Jul-Sept 1967	Oct-Dec 1967	Jan-Mar 1968	Apr-Jun 1968	Total
		= p e s o s =			
Fertilizers	19,896.66	7,569.25	33,220.65	60,212.81	120,899.37
Chemicals	7,721.78	49,264.22	6,207.65	1,506.16	64,699.81
Other Supplies *	30,445.48	19,983.32	15,457.81	7,981.60	73,868.81
Farm Equipment	2,871.60	1,080.10	694.70	994.95	5,641.35
Vegetable Seeds	-	8,012.50	13,365.23	3,809.82	25,187.55
Farm Machineries	-	26,000.00	42,756.10	21,928.50	90,684.60
Total	60,935.52	111,909.99	111,702.14	96,433.84	380,981.49

* Include Jute sacks, ropes etc.

this harvester through indent prices from Japan and entered the Philippines without any tariff duties because of its cooperative status. Starting January, 1968, all farm machineries acquired through ADCR funds were coursed through RPMC and so far, 8 units of irrigation pumps amounting to ₱52,349.70 was purchased,

During the one year of operation of the RPMC, ₱380,981.40 was the total amount of sales for supplies and materials. About 30 percent of the sales were fertilizers. Sales was not restricted in the provinces but a considerable amount was sold to nearby provinces like Bulacan, Nueva Ecija and Laguna.

Although RPMC handles direct sales to farmers, it also distributes production supplies through the authorized farm supply dealers located strategically in the province. There are a total of 15 authorized supply dealers that manage the distribution of production inputs and 5 more dealers have applied for dealership. Because of the importance of production supply distribution aspect in agricultural development, it was envisioned to have at least one supply dealer in a municipality in the province.

5.8.2. Seeds

The province pioneered in producing high yielding varieties like IR8 and at the same time made a role in distri-

Table 65. PROCUREMENT AND LOCAL SALES OF HIGH YIELDING VARIETIES. RPMC, ADCR. AS OF JUNE 30, 1968.

Rice Variety	Procurement Quantity (cav)	Procurement Value (₱)	Local Sales Quantity (cav)	Local Sales Value (₱)
Jun-Sept'67				
IR8	2,767.39	67,088.26	966.18	28,801.50
C4-63	20.00	600.00	5.22	192.50
IR5	9.37	294.13	1.22	52.50
	2,796.76	67,982.39	972.62	29,046.50
Oct-Dec'67				
IR8	-	-	220.10	5,546.00
C4-64	1,269.29	33,428.66	390.00	13,650.00
IR5	97.50	2,554.47	77.22	2,712.50
	1,366.79	35,983.13	687.32	21,908.50
Jan-Mar'68				
IR8	-	-	122.60	2,995.00
C4-64	595.00	14,715.07	772.35	27,037.50
IR5	264.35	7,499.32	227.38	7,962.50
	859.35	22,214.39	1,122.33	37,995.00
Apr-Jun'68				
IR8	12,549.00	338,176.25	1,536.26	28,074.00
C4-64	102.60	2,054.00	240.38	8,417.50
IR5	1,218.16	29,232.96	622.37	22,409.50
	13,869.76	369,463.21	2,399.01	58,901.00
Total	18,892.66	495,643.12	5,181.28	147,851.00

buting seeds in the province and throughout the Philippines. Before the creation of ADCR, around 5,000 cavans of certified seeds were produced in the province and ADCR had started to distribute these seeds.

To date, 18,892 cavans of seeds of high yielding varieties was procured amounting to ₱485,643. Sales of seeds is not confined in the province alone but also exported to other countries. A total of 5,981 cavans was sold with a total value of ₱147,851.

5. 6. 3. Rice Export

ADCR was credited for exporting 4,500 cavans of IR8 seeds to Burma. This export amounted to ₱142,450. Such export was one of the first that was executed by the Philippine government. With this experience and the reputation of the ADCR, the RPMC became successful in exporting seeds to other countries. To date, a total of 12,769 cavans with a total amount of ₱550,493 was exported to other countries. The importing countries were Nicaragua, Liberia, South Vietnam, Israel and Venezuela. The amount of seeds imported ranged from 23 to 8,000 cavans. There are still a number of pending orders and negotiations are underway.

Table 66. EXPORTS OF IR8 RICE VARIETY.
RPMC, ADCR. AS OF JUNE 30, 1968.

Country	Date	Quantity (cav)	Value (₱)
Burma *	6- -67	4,500	142,450.00
Nicaragua	11-22-67	23	995.27
Liberia	5-6-68	23	1,109.91
South Vietnam	5-20-68	7,951	248,468.75
Israel	6-22-68	4,545	145,117.20
Venezuela	6-30-68	227	12,351.11
	Total	17,269	₱ 550,493.11

* This particular export was executed by the ADCR and not necessarily credited to RPMC.

5.9. Implications

a) Immediate establishment of an agricultural program in a municipal, provincial or regional level.

Now that area development concept has been found effective in implementing development schemes, an agricultural program in a municipality, provincial or regional level must immediately be started and must be provided with all the necessary ingredients for promoting agriculture. For a project to become a success, one must bear in mind that capital outlay must be fully satisfied and supervisory services must be at a high level. No matter how nice a program will be and the two factors are not provided for, it just be another program similar to what the government had started years back. The first factor could be obtained by diverting some funds for agricultural development and budgeted in a manner that it will be used wisely. Technical men with the experience and technical know-how should be employed to make them capable of managing and supervising projects efficiently. Such a case should not be influenced by politicians and technicians should always try to do the job objectively and with integrity.

b) *Technological resources must be concentrated in potential areas for rice farming.*

Potential areas like Isabela in the North, the Central Plains, Laguna in South of Luzon and Camarines Sur in Bicol region are enough areas to sufficiently produce the rice requirements of Luzon. Because a number of inhabitants in the Visayas and Mindanao are corn-eaters, rice farming could be worked out in Iloilo and Cotabato provinces. The experience of Rizal province, where the total rice area is almost the same as of Cabanatuan in Nueva Ecija, and all production resources were provided for, production processes were intensified and therefore attained a commendable results in rice production.

Instead of putting up extensive assistance to less productive areas which are more or less sporadic in nature, same impact in rice production could be achieved if concentrated in the above areas. Those areas where all forms of assistance in increasing productivity were given should instead devote their land to more productive staple crops suited or needed most by the locality or industrial sector. This plan would mean savings on the part of the government and at the same time encourages farmers to plant other staple crops. As of now, rice had been a problem because people knew only eating rice.